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IN England, the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Naval Architects, the Iron and Steel Institute, and the Society of Telegraph Engineers and of Electricians have united to erect a memorial to the late Sir WILLIAM SIEMENS, in the form of a window in Westminster Abbey. Many Americans will learn with regret that the five English societies mentioned have decided that the subscriptions, which are limited to one guinea, shall be confined to their own members.

IN our issue of May 3d, we reviewed the annual report of the Batopilas Silver Mining Company in a manner that we now recognize to have been not only too harsh but unjust, and we trust that this unsolicited acknowledgment of our error will be accepted as frankly as it is given. Aside from minor mistakes, since corrected by the managers of the company, an examination of the accounts, freely accorded to us, accompanied with full explanations, has convinced us that we were mistaken. We took the report to be a summary of all the transactions of the company. In reality, it refers only to the receipts and disbursements at Batopilas. The accounts themselves are so voluminous as to render their publication a matter of great and unnecessary expense. Mr. E. W. A. JÖRGENSEN, who is the book-keeper, has written a reply that explains many points on which misapprehension on our part was natural. In accepting these explanations as satisfactory, we are committing an act of tardy justice to those to whom we have done a wrong.

THE troubles in the Hocking Valley coal district are going through peculiar phases, unprecedented, we believe, in the annals of American struggles between miner and operator. Following a course for which there are many precedents, the Columbus & Hocking Valley Coal and Iron Company and the Ohio Mining Exchange decided to break the opposition of their men by bringing a fresh contingent of laborers into the mines. Warned by the experience of others, and following an example frequently set, the companies engaged a force to protect their men against violence. A body of armed detectives accompanied the new men, because the governor of the State had refused protection on the ground that he could not interfere until acts of violence had been committed. So far as we know, the right of an employer of labor to protect men who have agreed to do work at given wages, whatever they might be, has never been questioned. In spite of this, the Pinkerton detectives have been arrested at New Straitsville, and have been forced to agree to discard their guns pending trial, the charge being riot and unlawful usurpation of the office of constable. If these charges are sustained, they leave an employer of labor in an absolutely defenseless condition. He must calmly wait until strikers have found it necessary to give emphasis to their usual threats by acts of violence, provided his workmen have not been thoroughly frightened beforehand, and then he may call for State aid. We hold that men who are on a strike have no right to complain of the employment of armed men on the part of employers. They have so frequently committed acts of violence, and this fact is so generally known, that an employer could not get together a fraction of his needed complement of men, unless he could give them good evidence of his determination to shield them against the violent persecution of his fellow-laborers.

WE print elsewhere a letter from Mr. JOHN PROVIS, a well-known mining engineer, in which he touches upon a matter that has certainly caused a good deal of alarm among first-class makers of mining machinery in this country. It is not too much to say that we have been in great danger of losing an important market, because the reputation of American machinery has suffered from the misdoings of concerns that have undertaken to do work of which they know nothing. The new Potosi Company is not the only Venezuela mining concern that has suffered in a similar way. In the year 1882–1883, the 60-stamp El Callao mill used up 18 mortars, 5 cam-shafts, 181 tappets, 26 stems, and 18 stamp-heads. A comparison with ordinary American practice will show clearly how wretched the machinery must have been and how poorly handled. In this country, a mill manager would hold himself to be very outrageously treated if his mortars did not last as many years as the El Callao mortars lasted weeks. In the Black Hills gold mills, the best iron shoes last about fifty days with heavy stamps dropping ninety times a minute. In California, the average life of shoes made by any good manufacturer is from thirty to forty days on hard glassy quartz like the Callao rock. Dies last from forty to ninety days. The wear on cams and tappets is very slight, the former lasting from one to three years, and the other parts of the mill mentioned are broken only by accident or carelessness. We may even go a step farther than Mr. PROVIS, and assert, without fear of contradiction, that stamp-mill machinery, made by well-known and experienced firms in the East, the West, and the Pacific coast, will do more work and do it more economically than that made in England by concerns who may be well equipped and conscientious, but who undoubtedly have not the experience in this special line of work to which half a dozen American establishments can point with pride.

UNDER date of June 1st, a committee of the Kerber Creek Consolidated Mining and Smelting Company, of Saguache County, Colorado, has issued from its Cincinnati "headquarters" a very unique circular. The board of directors of this enterprising company has "unanimously agreed to adopt the latest improvements in mining machines and implements, for the purpose of developing to the greatest advantage their several valuable mines." Inspired by this lofty plan, "the company has decided to offer a premium of $500 cash for each patent that is adopted for use on its properties, and it has furthermore concluded to set aside enough of the non-assessable stock of the company to donate to each competitor twenty-five shares, value $10 per share, which shall be issued promptly to them upon their compliance with the requirements of the committee. The object in transferring these shares to them is to reimburse them for their time and trouble and at the same time to secure such a

body of men as members who can co-operate intelligently with us in the management of the company." This is a great scheme. Behold the committee of the Kerber Creek Consolidated Mining and Smelting Company sitting in judgment on the claims of numerous happy possessors of twenty-five shares of non-assessable ten dollar stock, anxiously awaiting the verdict which is to insure to them a $500 premium, after cheerfully depositing each an entry fee of $15, "which shall be applied to defraying clerk hire, rent, and other office expenses of the committee." Such an appeal to the far-famed inventive genius of the United States can not fail to arouse unbounded enthusiasm, be productive of an avalanche of $15 entry fees, and make the Kerber Creek Consolidated Mining and Smelting Company the model crank establishment of the United States. The only thing we marvel at is, that the cash premium and the entry fee are not ten times larger. Fifteen dollars is too cheap for twenty-five shares, unassessable, of the Kerber Creek Consolidated Mining and Smelting Company, of Saguache County, Colorado.

CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL. Replies not intended for publication should be addressed to the Editor of the ENGINEERING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

American vs. English Mining Machinery.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: A few weeks ago, at a public meeting of one of the most important gold companies in this republic, held in London, it was stated that English machinery had proved to be far more economical than American. This is quite true, and it is but right to state the reason. A great deal of machinery supplied to the Venezuelan mines has been made by Messrs. Hoff, Fontaine & Abbott, of Philadelphia, and more recently a 60-stamp mill for the Potosi Company, Limited, by the same parties. This mill it has been my misfortune to receive before its completion, and I say most unhesitatingly that never during a nine years' experience on the Pacific coast did I see such wretched work.

Where the average duration of a mortar is nine weeks, and sixty dies were completely worn out by 30 stamps in six weeks, and shoes barely lasted a week, it is scarcely to be wondered at that English companies should prefer their own machinery. This machinery was ordered by an American, then general manager of the Potosi Company, and why he managed to get the worst machinery at the highest price is a matter not yet explained.

The Callao and Union companies in this district are getting new mills of known makers, and I do not doubt for a moment but that, when at work, they will prove satisfactorily that first-class mining machinery is manufactured in the United States, and that for durability and economy it will fairly compare with any in the world. Obediently yours,

JOHN PROVIS, M.E.,
Resident Supt. New Potosi Company, Limited.

PERU MINES, GUAYANA, VENEZUELA, June 12.

Fuel in Cupola Smelting.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In feeding blast-furnaces for copper smelting, the common practice is, to feed into a furnace small quantities of coke and upon them the larger quantities of ore; so that finally the furnace is filled with what approximates an intimate mixture of coke and copper ore. Fuel is thus provided immediately at hand to carry the ores through the various chemical changes that they undergo, and at last to liquefy all the products in the fuzing zone of the cupola. The rapidity of this method of smelting requires that a large volume of air be supplied the coke, so that it may be totally consumed in a short time.

Ores, as they come ordinarily to a cupola, have been much comminuted by processes already undergone. Usually a fifth will pass through a mesh one quarter inch square, and sometimes as much as one half is in this fine state. When such is fed in upon the coke, it may be seen to envelope quite completely the separate lumps of it, and one wonders how it is reached by a sufficiency of air to oxidize it during the short time it can remain in the furnace. Theoretically, each lump of coke in the furnace charge should be entirely exposed to the blast. It may then duly ignite and burn more freely as it descends, until finally it is consumed in the region of the tuyeres. As a matter of necessity, fine ore must be smelted with the lump, and this fine ore will more or less envelope the pieces of coke, causing the carbon in them to be but imperfectly oxidized.

In the early summer of this year, a 48-inch water-jacket in the copper-works of the Elizabeth Mining Company of this place was smelting a basic and difficulty fusible ore. It was charged in the manner indicated above, and was well attended. Fuel, best Connellsville coke, introduced in 80-pound charges, and upon that were shoveled 600 pounds (7½ to 1) of ore. The average for this furnace had fallen to about 65,000 pounds of ore daily. Using the same fuel and ore, the charge was altered and so arranged that the blast could reach freely almost each separate lump of coke, in this wise: Coke, 240 pounds, was charged in at once, that it might form a considerable bed in the cupola. Ore, 1800 pounds, was weighed into a conical pile on the charging-floor, and the lumps from the outside of this pile shoveled in upon the coke-bed. The next coarser lumps were then shoveled in, and by this time the coke bed was covered with lumps, and so protected that no fine material could reach it. Not until then was any fine ore introduced; but it was then fed in as the charge settled and as it was required to keep that at its proper height. When more material was required, the charge was repeated in the same manner. Improvement was immediate, and the work of this furnace rose to 83,000 for that day. Following day, coke charge remaining 240 pounds, the ore charge was made 2050 pounds (8½ to 1), and to this added 228 pounds rich slag. With that burden, the furnace made daily averages of about 80,000 pounds of ore. This increased duty and burden seemed due entirely to more complete combustion of fuel, made possible by the open bed of coke protected by lump ore about it. Prof. R. H. Richards afterward mentioned that the charge recalled an inverted water-filter, and so it came to be called a filter charge. In smelting all conditions of ores and grades of matter, these filter charges only have since been used.

SOUTH STRAFFORD, VT., July 14. W. G.

NOTES FROM ALABAMA.

Special Correspondence of the Engineering and Mining Journal.

The Watts Coal, Coke, and Iron Company, of Warrior, Ala., has begun work on the branch line of railroad leading from the Louisville & Nashville road, near Warrior, to the mines, distant about one and a half miles. The grading will be rather light in comparison with some other lines in this neighborhood. The company has at present opened four or five drifts on the vein, which it proposes working. It is from 2½ to 3 feet thick, and in quality and position superior to any other coal known in the Warrior field. Major G. D. Fitzhugh, the manager of this company, has displayed excellent judgment in the location of this property, as regards quality of coal, the position of the vein, and close proximity to the railroad. The company expects to be ready to ship its product by October 1st.

The grading of the road to the Warrior Coal and Coke Company's mines from the Louisville & Nashville road is completed, and track-laying will begin in a week. This road is two and a half miles long, and has a well-constructed bed. The company has now seven drifts opened on the Pierce seam, which averages from two feet six inches to three feet of coal of excellent quality. A notice has been posted by the company notifying its miners that on and after August 1st prices for mining will be reduced from 86 cents to 65 cents a ton at the mouth of the rooms. I understand that all of the companies operating in this section have joined in this movement, and no doubt a strike will result from this action on the part of the companies.

I have just returned from a visit to the mines of the Cahaba Coal Mining Company at Blocton. Its No. 2 slope, which has recently been opened on what is locally known as the Underwood seam, is the largest in the State. It dips at about 20 degrees. The lower bench of the coal is six feet thick, clean, without any parting of any consequence. Over this, are about two and a half feet of muck, coal, and slate, which it will not take out. Nothing will be taken out except the lower bench, consequently there will be no dead-work. Below will be found an analysis of this coal which was made from samples taken from a section top to bottom of this seam:

Fixed carbon	60·75	Sulphur	0·48
Volatile matter	34·12	Ash	2·41
Moisture	2·24		
			100·00

There is hardly any doubt but that this is the finest coal in the Cahaba field. To Mr. T. H. Aldrich and Colonel Cadle, managers of this company, I am indebted for this information. The extension of its railroad one mile to its No. 2 mine is pushed forward as rapidly as possible.

The coal trade throughout this State is unusually dull for this season. Some of the mines are shut down entirely, and have been so for two months, while others are running either on quarter or half-time. I know of but four or five companies running full-time at present. In fact, the total output from all the mines in the State for the past three months will not exceed 175,000 tons. I have been unable to get reports from the different mines, mainly on account of the dullness of the trade, most operators feeling a delicacy in reporting "small business." The Birmingham Mineral Railroad has been opened for business, the road being completed to Sloss mines, twelve miles below this city. It is the best constructed piece of road in this section of the State, well drained, and a good bed.

Work on the extension of the Georgia Pacific Railroad west of Birmingham has been temporarily suspended on account of the financial troubles in New York and elsewhere. Eight firms of contractors who were at work on the first ten miles, and who had just got comfortably settled down, are thus thrown out, besides six or seven hundred hands. It is, however, generally thought that this suspension will not last long.

Of the eight blast-furnaces in this section, all are in blast except three. One of these will be blown in very soon.

Next week, I shall visit the mines in the Western part of the State, and shall write you in regard to them. CHARLES M. WEISS.

BIRMINGHAM, ALA.

CADMIUM IN ZINC-DUST.—At the Cilli zinc-works, Austria, experiments have been made recently to ascertain the quantity of cadmium in zinc-dust obtained in the distillation of zinc. As reported in the *Oesterreichische Zeitschrift*, the fine screened dust carries from 0·302 to 0·356 per cent of cadmium, while the coarse siftings carry as high as 0·262 per cent. In view of the fact that cadmium volatilizes at a lower temperature, the dust settling at the cooler parts of the prolongers was collected. After two hours' distilling, it contained 0·794 per cent; after four hours, 0·630 per cent; and after six hours, 0·283 per cent of cadmium. The experiments will be followed out further, in order to arrive at a concentration of the cadmium preliminary to its extraction.

THE HARRISON COAL-CUTTER IN SCOTLAND.—A committee of the Mining Institute of Scotland has reported on the working of the Harrison coal-cutter at the Whinhall pit of the Alloa Coal Company, Alloa, three machines being used undercutting the coal in the Cherry seam, which is worked by the long-wall system. The seam has a fire-clay floor and a fire-clay roof, and is 3 feet 4 inches thick. The committee reported that the machine was capable of holing in the seam from 36 to 42 square yards in eight hours' working, although 51 yards were reached in eight hours 45 minutes in one case, and the same amount in nine hours in another case. One of the best miners in the pit cut 5¼ square yards a day. A preliminary estimate makes the cost 157¼d. per 22½ cwts. as compared with 2s. for hand-work.

CHILI, HER MINES AND MINERS.—I

Written for the Engineering and Mining Journal.

The most important factor in the calculation of the copper manufacture and market for the past fifty years has been the production of Chili. This narrow strip of South America, with its population of less than two millions, has, during that long period, poured into the markets of the world about 50,000 tons of copper annually.

Until our war, and the consequent high tariff, there was a large trade between this country and South America. The following table of exports of copper bars from Chili, from 1847 to 1861, and the summary of exports of copper in all forms, is interesting:

EXPORTS FROM 1847 TO 1861.

Copper Bars.

	England.	Per cent.	North America.	Per cent.	France.	Per cent.	Germany.	Per cent.
1847-51.	$234,086	19	$401,916	40	$97,026	26	$17,980	18
1852-56.	249,055	21	449,147	44	78,477	20	49,034	48
1857-61.	731,046	60	165,463	18	204,476	54	33,942	34

Copper Ingo's.

1847-51.	$315,133	11	$66,446	21	$102	...	$22,319	11
1852-56.	815,110	28	120,830	38	5,116	9	76,170	38
1857-61.	1,745,979	61	131,540	41	52,263	91	103,683	51

Copper Ores.

1847-51.	$272,328	6	$59,882	3	.....	...	$49,510	13
1852-56.	1,561,795	32	507,147	33	$14,367	29	179,220	45
1857-61.	2,977,178	62	986,311	64	36,822	71	166,302	42

Total bars....	$1,214,187	$1,016,526	$379,979	$100,956
Total ingots....	2,876,222	318,816	57,481	202,172
Total ores.....	4,811,301	1,553,340	51,189	395,032
	$8,901,710	$2,888,682	$488,649	$698,160

Total exports from 1847 to 1861 12,977,201

During the first half of this period, the exportation of copper alone exceeded in value that of all Chili's other products.

From 1857 to 1861, the annual average value and percentage of Chili's exports were:

		Per cent.
Agricultural products	$5,170,209	24·5
Mineral	14,693,260	71 0
Sundries	931,263	4·5
		100·0

Wheat has gradually gained on copper, so that, taking 1867, for example, she exported of

		Per cent.
Copper ingot, bars, matte, and ore	$14,854,144	48·4
Wheat and flour	7,767,430	25·3
Silver in matte and ore	3,037,651	9·9
Coal	225,592	0·7

The country first learned the value of her wheat, strange to say, through the sudden demand made for it in 1848 and 1850 by California. Ere long, California ceased to want it; but the Australian gold-hunters had to be fed. Soon Australia raised more than she needed; but by that time, Chili had learnt that the world at large would buy her wheat as readily as her copper, and her *haciendados* proceeded to alter their system of agriculture and supply the demand with the same energy and resource as her miners had already shown in departing from their antiquated methods of mining and smelting. It would be more just to say that the same men brought to bear on their farming the lessons of progress they had learned in their mining; for, as the following sketch will show, all classes but the agricultural peons in that thriving little land are given to mining.

Chili was a mining country and metallurgical arts were practiced there before a Spaniard set foot on this continent. In more than one copper mine, Indian workings are met with where are found Indian stone implements with which the carbonates and other easily reduced ores of copper were extracted. These hammers closely resemble those used by the aborigines of North America; but as the Chilian Indian had to extract the metal from the ore by smelting, whereas the North American had native copper ready reduced by nature to his hand, the metallurgical skill possessed by the former implies the existence of a higher civilization than that known to have been attained by the latter.

Gold was also an object of search by the natives before the Spanish conquest, and they are said to have used silver. This is not unlikely, as native silver has in times past been largely produced by Chilian mines, and boulders of native silver are occasionally found on the surface. This use of the precious metals in Chili it was which hastened the conquest of the country; for rumors of its wealth reached Pizarro and his little army in Peru, and tempted Almagro and a few chosen adventurers to face the dangers of the Atacama desert in search of it.

When in 1535 they reached the Copiapo, Almagro gathered easily from the natives 500,000 ducats worth of gold, which, expecting more would be as easily obtained at every step of his progress southward, he distributed among his followers; but he found the temper of the people harsher and their wealth in gold smaller as he pushed his arms through the provinces of Huasco and Coquimbo into the great central plain. Nevertheless, gold, as he discovered, was to be had everywhere north of Conception, and with enforced native labor both alluvial diggings and gold veins were for nearly three centuries worked extensively and to a profit. Molena, who wrote in the middle of the last century, said: "The quantity of gold dug annually in Chili is difficult to estimate. That called *oro quintado*, which pays the fifth to the royal treasury, does not amount to less than 4,000,000 dollars, of which there is coined in the mint at San Jago one million and a half. The residue is exported in bullion or used in the country for plate or jewelry. The amount smuggled without paying the duty can not be calculated, but it certainly is very considerable."* But returns made in 1790 to the Spanish government place the yield much lower. They estimate as follows: The gold brought to the mint in 1790, 5212 merks, value, $721,754; silver brought to the mint in 1790, 29,700 merks, value, $146,132; and make the production of copper 30,000 quintals, value, $255,000. Total value of minerals produced in 1790, $1,322,786. In 1824, according to Miers, the production of gold had still further declined. He made it as follows:

Gold	$600,000
Silver	180,000
Copper	480,000
Mineral produced in 1824	1,260,000

The diminution in gold production steadily continued; for in 1869 the gold produced by the mint was $381,055; the total yield of silver was about $3,500,000; and of copper the quantity exported was equal to 60,560 tons, fine value, $27,000,000; total, $30,881,055.

Gold mining is now most active in Central Chili. The railroad from Valparaiso to Santiago at Limache, Tiltel, and elsewhere passes through regions that once subsisted on this precarious industry, and still at all these places in the wet season the hill-sides far above any water-courses, and even elevated plateaux, are worked by "peons" who are contented to earn but scanty wages in the hope of finding an occasional nugget. In the vicinity of alluvial diggings, there are always veins, and they are all narrow and the gold is so intimately associated with blende and copper and iron pyrites as to make its extraction imperfect and costly. For centuries, such mines as the Robles gold mine have been worked by narrow, low, tortuous galleries, which constantly depart from the horizontal, as the aspect of the lode has tempted the miners to run upward or downward, and here and there bulge into little caverns where a bunch of ore has been reached. Timbering the Chili miners never excelled in, and therefore these old mines are being abandoned on account of their insecurity, even though still returning some profit to their owners. One of the most charming spots in Chili is the Asiento Valley, which leads up to the Doomida Pass from Tiltel, and is one of the richest gold-fields. Lofty hills envelope on every side the narrow, fertile vale, the red tile roofs of a hamlet show above the orchards and laurel groves that seem to crowd the hollow, and at the head of the gorge rises a perpendicular cliff over 2000 feet high, where nature has here cleft the Central Range to its very core, and in doing so, has scattered its golden treasure.

Gold working is, moreover, by no means confined to this zone. To the south, gold is found, and as far north in the Atacama desert as Tres Puntas and Cachiyuyo gold hunting employs many hands, but rewards them poorly. Yet were as good methods of treatment adopted for gold ores as are employed for the extraction of silver, there are some lodes, as for instance, the Toro lode, of Andacolla, whose ore would repay exploration.

But while the gold production has declined, the statistics above quoted show that that of silver has increased; for whereas, in the official return of 1790, the yield of the silver mines is put at only $146,132, it has for the last fifty years, since the discovery first of Chañarcillo and then of Tres Puntas, and lastly of Caracoles, stood at from $3,000,000 to $4,000,000 annually.

But the most notable change has been in the copper industry, which, till the fourth decade of our century, was very trifling. As already seen, the government returns estimated the production in 1790 at 1000 tons, and in 1869 the annual exportation reached 60,560 tons.

When it is borne in mind that in 1790 the population of Chili was only about 350,000, and that it then produced about one and a half million dollars worth of metals, and that with a population of from one and a half to two millions, it has, for a third of a century past, supplied the world with about $20,000,000 worth of gold, silver, and copper, one realizes how intimately mining must influence the whole life of the country. Great Britain, with a population of 31,000,000, produced, when Chili's mines were most productive, only $65,000,000 worth of these metals. In the case of Chili, from $8 to $10 worth are produced per head of the population; in Great Britain, only $2.10 worth. In neither case, is the coal production included.

In Chili, not only is a very large part of the laboring population engaged in mining, but many of the land-owners are also mine-owners, and most of the mercantile houses have an indirect interest in mining as *habilitadors* or advancers. So much for the material bearing of mining on the people; but it also undoubtedly exerts a subtle moral influence; for since mining and gambling are occupations closely related, therefore we may fairly speculate on the effect the mineral wealth of the west coast has had in aggravating the reckless character of the people.

J. D., JR.

* Molena's *History of Chili*, London, 1809, vol i., p. 98.

ELECTRIC FIRING OF SHOTS.—Mr. André, in his series of letters to the *Colliery Guardian*, says: I have had the good fortune to see the blasting arrangements adopted in the driving of a long stone-drift or gallery in the St. Etienne District. The necessity for the gallery in opening up the distant portions of the concession is largely, if not wholly, due to the prohibition I have already alluded to. The length of the gallery, when completed, will be 770 yards; at present, only about 50 yards have been driven. As it is desired to drive with all possible speed, light machine-drills have been chosen for the boring, and electric ignition of the shots for the blasting. I have nowhere seen a more effective system. The cables are carried up to within six yards of the face of the work, and are protected by gas-pipes throughout a length of six yards. From the ends of these cables, bare iron wire carries the electric current to the fuses, from ten to twelve in number. The firing-machine is of the Siemens class, and is very compact and powerful. It is contained in a box of about one cubic foot capacity. Instead of the usual winch handle, a draw-bar is used to give rotary motion to the armature. This bar is provided with teeth like a rack, and with a cross-head which the operator seizes with both hands, while holding the machine down with his feet. By such an arrangement, great power may be exerted on the armature. The machine is commonly used in America, and it is capable of firing a dozen shots with certainty. In reply to my inquiries, I was informed that misfires were of very rare occurrence. The simultaneous firing has in this case been found to save fully 20 per cent of the labor of boring. I asked an American mining man the other day to what extent electrical ignition of blasts was adopted in the United States. He replied, "There is nothing else now." Though this was probably an exaggeration, it may be inferred from such a statement that the method is in general use.

INDUSTRIAL PROGRESS IN KENTUCKY.

Correspondence of the Engineering and Mining Journal.

Not getting ready for my trip to Colorado as soon as announced in my last letter, I will take advantage of the detention to give your readers a few items of historic interest. There is a decided movement onward among our people toward active and business-like results in the development of our material resources. We are not yet, of course, entirely free from the incubus of *ante-bellum* institutions and prejudices. A speech at our county-seat yesterday, in the interest of the Louisville Exhibition, soon to be open, led me to reflect upon some of the causes that still hinder progress. The speaker artfully made it clear that on the field of battle, in the forum, and in all other situations where valor, chivalry, eloquence, and medical skill enter into the account, Kentucky stands almost without a rival; but, said he, the most insignificant State in the sisterhood leads her in every thing else. He descanted on our vast coal, iron, and timber areas, the aptitude of our hill lands for the vine, and argued that, even with the natural and geographical advantage we had, the "Cotton States" were excelling us in many things. Bourbonism is the clog in the wheel; and this reminds me of a little piece or two of history connected with the early iron manufacture of our State.

The first furnace that ever went into blast west of the Alleghany Mountains rejoiced in the prænomen Bourbon. It went into blast in 1792, supplying all of the early settlers with cooking utensils and heating-stoves, and with all the iron they needed. It was situated on Slate Creek, in Bath County, on the turnpike road now leading from Owingsville to the Chesapeake & Ohio Railroad. The castings made there were very durable, but the furnace manipulation was of a very wasteful kind, large percentages of iron being drawn off in the slag.

Many distinguished personages visited Bourbon Furnace in those old days when "Lo! the poor Indian" was more troublesome farther East than now. General Spotswood, of Virginia, was a guest of Bourbon Furnace in 1795, and while there he closed negotiations with Gen. Henry Lee, of Richmond, Va., for six thousand acres of land. This was before the days of government land surveys and limitations to one's locative powers and purposes. The records show that on the 24th of December, 1814, the furnace authorities delivered to General Andrew Jackson, in New Orleans, a large quantity of twenty-four pound balls, and also a sufficient supply of grapeshot. But to give the finishing touch to "Bourbon" reminiscences as connected with this old furnace, all that remains to be jotted down is, that Louis Philippe, afterward king of France, honored the furnace with his presence in 1814. He came thither from Baltimore, and was the guest of Col. Thomas Dye Owings, the chief owner of the furnace. He assumed the *rôle* of commoner among those early ferruginous sovereigns of the county of Bath. In a word, the king to be roughed it a few days out at the furnace, but was hospitably and sumptuously entertained at Owingsville. He remembered the kindness afterward, and sent a letter and a book to his hostess, Mrs. M. N. Owings, June 17th, 1815. And now the Hon. Van Buren Young, to whom I am indebted for these records, comes to the front with a proposition to the people of Bath to purchase the old stack, which is still standing, and dedicate it to the memory of the men who erected it. This would be a nice, sweet, sentimental thing to do, but smacks too much of Bourbonism. Why not raise the money and put up another furnace? This would honor those who erected the old furnace in a much more desirable way. The ore in that region of country is still abundant, and of a fine quality, too, yet it lies dormant, as it were, waiting for energy and a little capital to arouse it to its intended use.

The article taken from the Fourth Annual Report of the United States Geological Survey on Popular Fallacies as to mines is timely. Regular articles of an elementary character on mining, mineralogy, geology, metallurgy, and assaying would be of great advantage to many of your readers, and doubtless would increase the number of them. A fallacy popular in Colorado is, that "a green stain must be followed, no matter where it leads." No less a personage than Senator Hill is given as authority for the saying. Here is an illustration of one of the statements in the article mentioned. "The —— mine has a large amount of crystallized galena, and some of it—from present appearances a large amount—is that *rich* (italics mine) class of ore known as 'steel galena.'" This is from an "expert report" on an important property. "Experts" indulge in popular fallacies about as extensively as old miners. I shall make a special effort to find some of that rich "steel galena." I have seen quite a large quantity of steel galena in the last eight or ten years, but have never been fortunate enough "to strike it rich" up to the present date. I leave on the 15th for Crested Butte, Tomichi, Maysville, and Silverton, Colorado, and will pencil you on the mining outlook of these camps.

T.

RICHMOND, KY., July 12.

THE ACTION OF CEMENTS ON METALS.—The late Mr. J. C. Trautwine, civil engineer, has left a brief memorandum, giving the result of some experiments that he made to determine the corrosive action of hydraulic cements upon metal imbedded in them. The cements used were English, Portland, and Louisville; in addition to which, he tried plaster of Paris pure, and also mixed with equal measures of the cements. All were of the consistency of common mortar, and all were kept in an upper room during ten years, unexposed to moisture other than that of the indoor atmosphere. The metals were partly imbedded in the pastes and partly projected from them. They consisted of cut iron nails, some of which were galvanized; smooth iron wire nails; brass in both sheet and wire; zinc in sheet; copper wire; and solid cylinders of lead three eighths of an inch in diameter. The result at the end of ten years was, that all the metals in both the pure cements were absolutely unchanged; and this was also the case with the plaster of Paris, with the exception of the ungalvanized nails, which had become covered with a thin coating of rust, as were also those in the mixtures of plaster and cement, but to a less degree. Mr. Trautwine concluded from his experiments that, if dampness be excluded, both cement and lime mortar will protect for an indefinite time from injury all the metals employed in ordinary constructions.

THE NEW YORK ORE MILLING AND TESTING-WORKS.

With the object of affording mining engineers an opportunity to carry out practical working tests of gold and silver ores, works have been established in this city recently, and have now been running for some time. We had an opportunity recently to visit them, and found them excellently equipped for the service for which they are intended. The accompanying illustration will aid in forming an idea of the arrangement of the plant. The entire machinery is driven by a 10 horse-power Ames portable engine, not shown in our engraving. Coarse ore received is crushed in a rock-breaker, which, it will be seen, rests on a heavy foundation. After being quartered for sampling in the usual way, the sample thus obtained is reduced to smaller size in a small sample-grinder. The crushed ore is fed by an automatic Hendy feeder of full size into a small stamp-mill having three 250-pound stamps. The pulp runs over a copper plate, and then passes by an automatic sampler consisting of a gutter, which at intervals of about one minute is forced under the flow of pulp by means of a small gear-wheel driven by a worm. From the copper plate, the ore may be run by a launder on to a full-sized Frue vanner, the tailings from which run over an automatic sampler into a settling-tank. The water is kept at a constant head in a vat fed by a ball-cock. Or the pulp may be run by a launder into a pan, one half the usual size, and thence to a settler with quicksilver siphon-tap. For leaching tests, there is a leaching-vat, purposely made deep, to test the question how far the ore presents mechanical difficulties in filtering. Below it, are two precipitating-tanks, one above the other, so that tests can be made by the Russell process. The mill has an assay equipment and a bullion furnace. It is well lighted throughout, and special facilities have been provided for that most important point, thorough cleaning of all the machinery after a test.

The machinery is readily accessible throughout, the belts, etc., being kept out of the way. When ores are sent already crushed, they are charged into a hopper from which they are either automatically fed to the vanner or to the amalgamating machinery. In a separate shed, is a small but neatly arranged reverberatory roasting-furnace, and it is the intention to add also a set of rolls, with jigs and percussion-tables.

The works (which we may state are located at No. 528 West Sixteenth street, the office being at No. 90 Broadway, Room 43) are therefore now equipped for crushing and sampling, for free gold and silver milling and amalgamation, including the concentration of sulphurets, for concentrating finely crushed ores for roasting and pan amalgamation and for leaching.

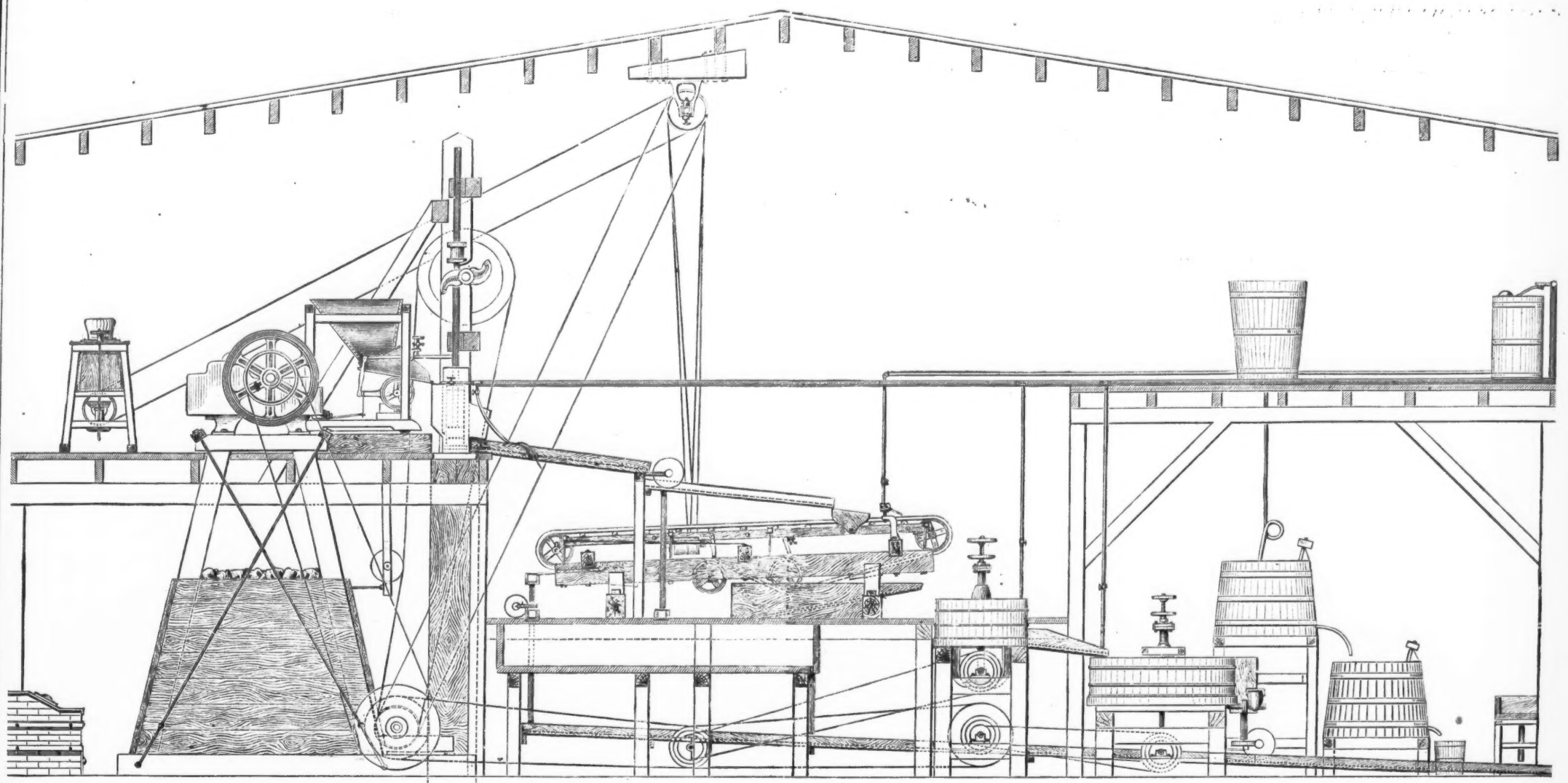
NEW PUBLICATIONS.

A TREATISE ON EARTHY AND OTHER MINERALS AND MINING. By D. C. DAVIES, F.G.S. London: Crosby Lockwood & Co. 1884. Crown 8vo, 336 pages. With Index and Numerous Illustrations.

Mr. Davies, who is well known in this country as the author of a treatise on metalliferous minerals and mining, has undertaken to give some information on what might be termed the minor mining industries, which are generally neglected in more pretentious volumes. Mr. Davies himself seems to believe that, perhaps, in point of time, it should have preceded its companion volume already alluded to. It is somewhat difficult to understand why he has chosen the title his volume bears, since the following sentences quoted from him show a wider scope: "It will be observed that in the present book the distinctively earthy minerals are first considered. Next come those minerals which are compounds of earths and alkalies, some of which have a metallic base; after which, carbon and compounds of carbon are noticed. Sulphur next occupies a place by itself, and then follow a number of metallic minerals distinguished by the extreme difficulty with which their metals have been extracted from them, and the rapidity with which those metals, when so obtained, and when unalloyed with others, unite with oxygen."

Accordingly, Mr. Davies divides his work into four parts; the first on earthy minerals; the second on haloid minerals; the third, carbon, its compounds and sulphur; and the fourth on metallic minerals. We are not much impressed with his chapters on silica, and on alumina, magnesia, lime, and some of their combinations; and the third, on clays, is perhaps too much burdened with local matters to interest the general reader. Salt, which is treated in the fourth and fifth chapters, is very much more satisfactory, though of course it is a subject that might comfortably fill a volume by itself. Borax, gypsum, fluorspar, and alum are passed over lightly. The best part of the work, in our estimation, and the one that will commend it particularly to American readers, is a series of chapters on phosphates. A considerable portion of the information that Mr. Davies has given to his readers in the seventy pages he devotes to this important subject has been collected by him personally in visits to all of the principal phosphate districts of Europe. Beginning with a description of the phosphate deposits of Canada, he follows it up in turn with an account of those of Norway, of North Wales, of the Estramadura District, Spain, of the coprolite beds of Cambridgeshire, of the Belgian, French, and Russian deposits, and of the well-known Nassau District in Germany, closing it with a brief account of the South Carolina beds. On many of these occurrences there is quite an extensive literature, some of which, notably that relating to phosphates in this country and inCanada, Mr. Davies does not appear to be familiar with: but we have nowhere met with a general account embracing all the known deposits that is equal to the one he has compiled. The peculiarities of phosphate deposits in various formations are very thoroughly illustrated, and are worthy of the close study of those who are interested in this growing industry.

Among the other chapters that we note particularly is one on diamond mining and one on the sulphur deposits of Sicily and Iceland. The pyrites mines, now so great a factor, are poorly treated, being dismissed in five pages. The fourth part embraces arsenic, cobalt, molybdenum, and antimony (without a word on Japanese deposits, which have been flooding England with ore of late). One chapter alone, that on manganese ores, deserves special commendation. The book closes with a classified list of mineral substances.



Sample Grinder. Rock-Breaker. Stamp-Feeder. Stamp Battery. Copper Plate. Frue Vanner. Pan. Settler. Leaching and Precipitating Tanks.

Automatic Sampler. Automatic Sampler. Automatic Sampler.

NEW YORK ORE MILLING AND TESTING-WORKS.

THE DEPOSITION OF ORES.*

By J. S. Newberry.

MINERAL VEINS.

In the *Quarterly* for March, 1880, a paper was published on the Origin and Classification of Ore-Deposits, which treated, among other things, of mineral veins. These were grouped in three categories, namely, 1. Gash-Veins; 2. Segregated Veins; 3. Fissure-Veins; and were defined as follows:

Gash-Veins.—Ore-deposits confined to a single bed or formation of *limestone*, of which the joints, and sometimes planes of bedding, enlarged by the solvent power of atmospheric water carrying carbonic acid, and forming crevices, galleries, or caves, are lined or filled with ore leached from the surrounding rock; for example, the lead deposits of the Upper Mississippi and Missouri.

Segregated Veins.—Sheets of quartzose matter, chiefly lenticular and conforming to the bedding of the inclosing rocks, but sometimes filling irregular fractures across such bedding, found only in metamorphic rocks, limited in extent laterally and vertically, and consisting of material indigenous to the strata in which they occur, separated in the process of metamorphism; for example, quartz ledges carrying gold, copper, iron pyrites, etc., in the Alleghany Mountains, New England, Canada, etc.

Fissure-Veins.—Sheets of metalliferous matter filling fissures caused by subterranean force, usually in the planes of faults, and formed by the deposit of various minerals brought from a lower level by water, which under pressure and at a high temperature, having great solvent power, had become loaded with matters leached from different rocks, and deposited them in the channels of escape as the pressure and temperature were reduced.

Since that article was written, a considerable portion of several years has been spent by the writer continuing the observations upon which it was based. During this time, most of the mining centers of the Western States and territories, as well as some in Mexico and Canada, were visited and studied with more or less care. Perhaps no other portion of the earth's surface is so rich in mineral resources as that which has been covered by these observations, and nowhere else is to be found as great a variety of ore-deposits, or those which illustrate as well their mode of formation. This is so true that it may be said without exaggeration that no one can intelligently discuss the questions that have been raised in regard to the origin and mode of formation of ore-bodies without traversing and studying the great mining belt of our Western States and territories.

The observations made by the writer during the past four years confirm in all essentials the views set forth in the former article in the *Quarterly*, and while a volume might be written describing the phenomena exhibited by different mines and mining districts, the array of facts thus presented would be, for the most part, simply a reinforcement of those already given.

The present article, which must necessarily be short, would hardly have a *raison d'être* except that it affords an opportunity for an addition that should be made to the classes of mineral veins heretofore recognized in this country, and it seems called for by the recent publication of theories on the origin of ore-deposits that are incompatible with those hitherto presented and now held by the writer, and that, if allowed to pass unquestioned, might seem to be unquestionable.

BEDDED VEINS.

Certain ore-deposits that have recently come under my observation appear to correspond very closely with those that Von Cotta has taken as types of his class of "bedded veins;" and as no similar ones have been noticed by American writers on ore-deposits, they have seemed to me worthy of description.

These are zones or layers of a sedimentary rock, to the bedding of which they are conformable, impregnated with ore derived from a foreign source, and formed long subsequently to the deposition of the containing formation. Such deposits are exemplified by the Walker & Webster, the Piñon, the Climax, etc., in Parley's Park, and the Green-Eyed Monster and the Deer Trail, at Marysvale, Utah. These are all zones in quartzite that have been traversed by mineral solutions that have by substitution converted such layers into ore-deposits of considerable magnitude and value.

The ore contained in these bedded veins exhibits some variety of composition, but, where unaffected by atmospheric action, consists of argentiferous galena, iron pyrites carrying gold, or the sulphides of zinc and copper containing silver or gold, or both. The ore of the Walker & Webster and the Piñon is chiefly lead carbonate and galena, often stained with copper carbonate. That of the Green-Eyed Monster—now thoroughly oxidized as far as penetrated—forms a sheet from twenty to forty feet in thickness, consisting of ferruginous, sandy, or talcose, soft material carrying from twenty to thirty dollars to the ton in gold and silver. The ore of the Deer Trail forms a thinner sheet containing considerable copper, and sometimes from two hundred to three hundred dollars to the ton in silver.

The rocks that hold these ore-deposits are of Silurian age, but they received their metalliferous impregnation much later, probably in the Tertiary, and subsequent to the period of disturbance in which they were elevated and metamorphosed. This is proved by the fact that, in places where the rock has been shattered, strings of ore are found running off from the main body, crossing the bedding and filling the interstices between the fragments, forming a coarse stock-work.

Bedded veins may be distinguished from fissure-veins by the absence of all traces of a fissure, the want of banded structure, slickensides, selvages, etc.; from gash-veins and the floors of ore that often accompany them, as well as from segregated veins, they are distinguished by the nature of the inclosing rock and the foreign origin of the ore. Sometimes the plane of junction between two contiguous sheets of rock has been the channel through which has flowed a metalliferous solution, and the zone where the ore has replaced by substitution portions of one or both strata. These are often called blanket veins in the West, but they belong rather to the category of contact deposits as I have heretofore defined them. Where such sheets of ore occupy by preference the planes of contact between adjacent strata, but sometimes desert such planes, and show slickensided walls and banded structure, like the great veins of Bingham, Utah, these should be classed as true fissure-veins.

THEORIES OF ORE-DEPOSIT.

The recently published theories of the formation of mineral veins, to which I have alluded, are those of Professor Von Groddeck* and Dr. Sandberger,† who attribute the filling of veins to exudations of mineral solutions from the wall-rocks (that is, lateral secretions), and those of Mr. S. F. Emmons‡ and Mr. G. F. Becker,§ who have been studying, respectively, the ore-deposits of Leadville and of the Comstock, by whom the ores are credited to the leaching of adjacent igneous rocks. The lack of space must forbid the full discussion of these theories at the present time; but I will briefly enumerate some of the facts that render it difficult for me to accept them.

First. The great diversity of character exhibited by different sets of fissure-veins that cut the same country-rock seems incompatible with any theory of lateral secretion. These distinct systems are of different ages, of diversified composition, and have evidently drawn their supply of material from different sources. Hundreds of cases of this kind could be cited, but I will mention only a few; among others, the Humboldt, the Bassick and the Bull-Domingo, near Rosita and Silver Cliff, Colo. These are veins contained in the same sheet of eruptive rock, but the ores are as different as possible. The Humboldt is a narrow fissure carrying a thin ore-streak of high grade, consisting of sulphides of silver, antimony, arsenic, and copper; the Bassick is a great conglomerate vein containing tellurides of silver and gold, argentiferous galena, blende, and yellow copper; the Bull-Domingo is also a great fissure filled with rubbish containing ore-chimneys of galena with tufts of wire-silver. I may also cite the Jordan, with its intersecting and yet distinct and totally different veins; the Galena, the Neptune, and the American Flag in Bingham Cañon, Utah; and the closely associated yet diverse system of veins, the Ferris, the Washington, the Chattanooga, the Fillmore, etc., in Bullion Cañon at Marysvale. In these and many other groups that have been examined by the writer, the same rocks are cut by veins of different ages, having different bearings, and containing different ores and vein-stones. It seems impossible that all these diversified materials should have been derived from the same source, and the only rational explanation of the phenomena is that which I have heretofore advocated, the ascent of metalliferous solutions from different and deep-seated sources.

Another apparently unanswerable argument against the theory of lateral secretion is furnished by the cases where the same vein traverses a series of distinct formations and holds its character essentially unaffected by changes in the country-rock. One of many such may be cited in the Star vein at Cherry Creek, Nev., which, nearly at right angles to their strike, cuts belts of quartzite, limestone, and slate, maintaining its peculiar character of ore and gangue throughout.

This and all similar veins have certainly been filled with material brought from a distance and not derived from the walls.

LEACHING OF IGNEOUS ROCKS.

The arguments against the theory that mineral veins have been produced by the leaching of superficial igneous rocks are in part the same a s those already cited against the general theory of lateral secretion. They may be briefly summarized as follows:

1. Thousands of mineral veins in this and other countries occur in regions remote from eruptive rocks. Into this category come most of those of the eastern half of the continent, namely, Canada, New England, the Alleghany belt, and the Mississippi Valley. Among these, I will refer only to a few selected to represent the greatest range of character, namely, the Victoria lead mine near Sault Ste. Marie, the Bruce copper mine on Lake Huron, the gold-bearing quartz veins of Madoc, the Gatling gold vein of Marmora, the Acton and the Harvey Hill copper mines of Canada, the copper veins of Ely, Vt., and of Blue Hills, Me., the silver-bearing lead veins of Newburyport, Mass.; most of the segregated gold veins of the Alleghany belt, the lead veins of Rossie, Ellenville, and at other localities farther south; the copper-bearing veins of Virginia, North Carolina, and Tennessee; the veins carrying argentiferous galena in Central Kentucky and in Southern Illinois; the silver, copper, and antimony veins of Arkansas; and the lead and zinc deposits of Missouri and the Upper Mississippi. In these widely separated localities, are to be found fissure, segregated, and gash-veins and a great diversity of ores which have been derived sometimes from the adjacent rocks—as in the segregated veins of the Alleghany belt and the gash-veins of the Mis sissippi region; and in other cases—where they are contained in true fissure-veins—from a foreign source, but all deposited without the aid of superficial igneous rocks, either as contributors of matter or force.

2. In the great mineral belt of the far West, where volcanic emanations are so abundant and where they have certainly played an important part in the formation of ore-deposits, the great majority of veins are not in immediate contact with trap rocks, and they could not therefore have furnished the ores. A volume might be formed by a list of the cases of this kind, but I can here allude to a few only, most of which I have myself examined, namely:

(*a.*) The great ore-chambers of the San Carlos Mountains in Chihuahua, the largest deposits of ore of which I have any knowledge. These are contained in heavy beds of limestone, which are cut in various places by trap dikes, which, as elsewhere, have undoubtedly furnished the stimulus to chemical action that has resulted in the formation of the ore-bodies, but are too remote to have supplied the material.

(*b.*) The silver mines of Santa Eulalia, in Chihuahua, from which during the last century one hundred and twelve millions of dollars were

* From the *School of Mines Quarterly*.

* *Die Lehre von den Lagerstätten der Erze*, von Dr. Albrecht von Groddeck, Leipzig, 1879.

† *Untersuchungen über Erzgänge*, von Fridolin Sandberger, Wiesbaden, 1882.

‡ *Geology and Mining Industry of Leadville*, Annual Report, Director U. S. Geol. Surv., 1881.

§ *Geology of the Comstock Lode and Washoe District*, G. F. Becker, Washington, 1883.

It is but justice to Messrs. Becker and Emmons to say that theirs are admirable studies, thorough and exhaustive, of great interest and value to both mining engineers and geologists, and most creditable to the authors and the country. No better work of the kind has been done anywhere, and it will detract little from its merit even if the views of the authors on the theoretical question of the sources of the ores shall not be generally adopted.

taken, opened on ore-deposits situated in Cretaceous limestones like those of San Carlos, and apparently similar ore-filled chambers; an igneous rock caps the hills in the vicinity, but is nowhere in contact or even proximity to the ore-bodies. (See Kimball, *Amer. Jour. Sci.*, March, 1870.)

(*c.*) The great chambers of Tombstone and the copper veins of the Globe District, the Copper Queen, etc., in Arizona.

(*d.*) The large bodies of silver ore at Lake Valley, New Mexico; chambers in limestone, like (*c*).

(*e.*) The Black Hawk group of gold mines, the Montezuma, Georgetown, and other silver mines in the granite belt of Colorado.

(*f.*) The great group of veins and chambers in the Bradshaw, Lincoln, Star, and Granite districts of Southern Utah, where we find a host of veins of different character in limestone or granite, with no trap to which the ores can be credited.

(*g.*) The Crismon-Mammoth vein of Tintic.

(*h.*) The group of mines opened on the American Fork, on Big and Little Cottonwood, and in Parley's Park, including the Silver Bell, the Emma, the Vallejo, the Prince of Wales, the Kessler, the Bonanza, the Climax, the Piñon, and the Ontario. (The latter, the greatest silver mine now known in the country, lies in quartzite, and the trap is near, but not in contact with the vein.)

(*i.*) In Nevada, the ore-deposits of Pioche, Tempiute, Tybo, Eureka, White Pine, and Cherry Creek, on the east side of the State, with those of Austin, Belmont, and a series too great for enumeration in the central and western portions.

(*j.*) In California, the Bodie, Mariposa, Grass Valley, and other mines.*

(*k.*) In Idaho, those of the Poor Man in the Owyhee District, the principal veins of the Wood River region, the Ramshorn at Challis, the Custer and Charles Dickens, at Bonanza City, etc.

In nearly all these localities, we may find evidence not only that the ore-deposits have not been derived from the leaching of igneous rocks, but also that they have not come from those of any kind which form the walls of the veins.

The gold-bearing quartz veins of Deadwood are so closely associated with dikes of porphyry that they may have been considered as illustrations of the potency of trap dikes in producing concentration of metals. But we have conclusive evidence that the gold was there in Archæan times, while the igneous rocks are all of modern, probably of Tertiary date. This proof is furnished by the "Cement mines" of the Potsdam sandstone. This is the beach of the Lower Silurian sea when it washed the shores of an Archæan island, now the Black Hills. The waves that produced this beach beat against cliffs of granite and slate containing quartz veins carrying gold. Fragments of this auriferous quartz, and the gold beaten out of them and concentrated by the waves, were in places buried in the sand beach in such quantity as to form deposits from which a large amount of gold is now taken. Without this demonstration of the origin and antiquity of the gold, it might very well have been supposed to be derived from the eruptive rock.

Strong arguments against the theory that the leaching of superficial igneous rocks has supplied the materials filling mineral veins are furnished by the facts observed in the districts where igneous rocks are most prevalent, namely: (1.) Such districts are proverbially barren of useful minerals; (2.) Where these occur, the same sheet of rock may contain several systems of veins with different ores and gangues.

The great lava plain of Snake River, the Pedrigal country of Eastern Oregon, Northern California, and Mexico are without valuable ore-deposits. The same may be said of the Pancake Range and other mountain chains of igneous rock in Nevada, while the adjacent ranges composed of sedimentary rocks are rich in ore-deposits of various kinds. A still stronger case is furnished by the Cascade Mountains, which, north of the California line, are composed almost exclusively of erupted material, and yet in all this belt, so far as known, not a single valuable mine has been opened. In contrast with this is the condition of things in California, where the Sierra Nevada is composed of metamorphic rocks that have been shown to be the repositories of vast quantities of gold, silver, and copper. Cases belonging to this category may be found at Rosita and Silver Cliff, where the diversity in the ores of the mines already enumerated can hardly be reconciled with the theory of a common origin. At Lake City, the prevailing porphyry holds the veins of the Ute and Ulé and the Ocean Wave mines which are similar, and the Hotchkiss, the Belle, etc., entirely different.

We have no evidence that any volcanic eruption has drawn its material from zones or magmas especially rich in metals or their ores, and on the contrary, volcanic districts, like those mentioned, and regions such as the Sandwich Islands, where the greatest eruptions have taken place, are poorest in metalliferous deposits.

All the knowledge we have of the subject justifies the inference that most of the igneous rocks that have been poured out in our Western territories are but fused conditions of sediments that form the substructure of that country. Over the great mineral belt that lies between the Sierra Nevada and the front range of the Rocky Mountains, and extends not only across the whole breadth of our territory, but far into Mexico, the surface was once underlain by a series of Palæozoic sedimentary strata not less than from twenty to thirty thousand feet in thickness; and beneath these, at the sides, and doubtless below, were Archæan rocks, also metamorphosed sediments. Through these, the ores of the metals were generally though sparsely distributed. In the convulsions that have in recent times broken up this so long quiet and stable portion of the earth's crust (and which have resulted in depositing in thousands of cracks and cavities the ores we now mine), portions of the old table-land were in places set up at high angles forming mountain chains, and doubtless extending to the zone of fusion below. Between these blocks of sedimentary rocks, oozed up through the lines of fracture quantities of fused material, which also sometimes formed mountain chains; and it is possible and even probable that the rocks composing the volcanic ridges are but phases of the same materials that form the sedimentary chains. There is, therefore, no *a priori* reason why the leaching of one group should furnish more ore than the other; but, as a matter of fact, the unfused sediments are much the richer in ore-deposits. This can only be accounted for, in my judgment, by supposing that they have been the receptacles of ore brought from a foreign source; and we can at least conjecture where and how gathered. We can imagine, and we are forced to conclude, that there has been a zone of solution below, where steam and hot water, under great pressure, have effected the leaching of ore-bearing strata, and a zone of deposition above, where cavities in pre-existent solidified and shattered rocks became the repositories of the deposits made from ascending solutions, when the temperature and pressure were diminished. Where great masses of fused material were poured out, these must have been for a long time too highly heated to become places of deposition; so long indeed that the period of active vein formation may have passed before they reached a degree of solidification and coolness that would permit their becoming receptacles of the products of deposition. On the contrary, the masses of unfused and always relatively cool sedimentary rocks which form the most highly metalliferous mountain ranges (White Pine, Toyabe, etc.) were, throughout the whole period of disturbance, in a condition to become such repositories. Certainly highly heated solutions, forced by an irresistible *vis a tergo* through rocks of any kind down in the heated zone, would be far more effective leaching agents than cold surface water with feeble solvent power, moved only by gravity, percolating slowly through superficial strata.

Richthofen, who first made a study of the Comstock lode, suggested that the mineral impregnation of the vein was the result of a process like that described, namely, the leaching of the deep-seated rocks, perhaps the same that inclose the vein above, by highly heated solutions that deposited their load near the surface. On the other hand, Becker supposes the concentration to have been effected by surface waters flowing laterally through the igneous rocks, gathering the precious metals and depositing them in the fissure, as lateral secretion produces the accumulation of ore in the limestone of the lead region. But there are apparently good reasons for preferring the theory of Richthofen, namely, first, the veinstone of the Comstock is chiefly quartz, the natural and common precipitate of *hot* waters, since they are far more powerful solvents of silica than cold. On the contrary, the ores deposited from lateral secretion, as in the Mississippi lead region, at low temperature contain comparatively little silica; secondly, the great mineral belt to which reference has been made above is now the region where nearly all the hot springs of the continent are situated. It is, in fact, a region conspicuous for the number of its hot springs, and it is evident that these are the last of the series of thermal phenomena connected with the great volcanic upheavals and eruptions of which this region has been the theater since the beginning of the Tertiary age. The geysers of Yellowstone Park, the hot springs of the Wamchuck District in Oregon, the Steamboat Springs of Nevada, the geysers of California, the hot springs of Salt Lake City, Monroe, etc., in Utah, and the Pagosa in Colorado, are only the most conspicuous among thousands of hot springs that continue in action at the present time. The evidence is also conclusive that the number of hot springs, great as it now is in this region, was once much greater. That these hot springs were capable of producing mineral veins by material brought up in and deposited from their waters, is demonstrated by the phenomena observable at the Steamboat Springs, and which were cited in my former article as affording the best illustration of vein formation.

The temperature of the lower workings of the Comstock vein is now over 150 degrees Fahr., and an enormous quantity of hot water is discharged through the Sutro Tunnel. This water has been heated by coming in contact with hot rocks at a lower level than the present workings of the Comstock lode, and has been driven upward in the same way that the flow of all hot springs is produced. As that flow is continuous, it is evident that the workings of the Comstock have simply opened the conduits of hot springs, which are doing to-day what they have been doing in ages past, but much less actively, that is, bringing toward the surface the materials they have taken into solution in a more highly heated zone below. Hence it seems much more natural to suppose that the great sheets of ore-bearing quartz now contained in the Comstock fissure were deposited by ascending currents of hot alkaline waters than by descending currents of those which were cold and neutral. The hot springs are there, though less copious and less hot than formerly, and the natural deposits from hot waters are there. Is it not more rational to suppose, with Richthofen, that these are related as cause and effect, rather than that cold water has leached the ore and the silica from the walls near the surface? Mr. Becker's preference for the latter hypothesis seems to be due to the discovery of gold and silver in the igneous rocks adjacent to the vein, and yet, except in immediate contact with it, these rocks contain no more of the precious metals than the mere trace which by refined tests may be discovered everywhere. If, as we have supposed, the fissure was for a long time filled with a hot solution charged with an unusual quantity of the precious metals, nothing would be more natural than that the wall-rocks should be to some extent impregnated with them.

It will perhaps illuminate the question to inquire which of the springs and water currents of this region are now making deposits that can be compared with those which filled the Comstock and other veins. No one who has visited that country will hesitate to say the hot and not the cold waters. The immense siliceous deposits, carrying the ores of several metals, formed by the geysers of the Yellowstone, the Steamboat Springs, etc., show what the hot waters are capable of doing; but we shall search in vain for any evidence that the cold surface waters have done or can do this kind of work.

At Leadville, the case is not so plain, and yet no facts can be cited which really *prove* that the ore-deposits have been formed by the leaching of the overlying porphyry, rather than by an outflow of heated mineral solutions along the plane of junction between the porphyry and the limestone. Near this plane, the porphyry is often thoroughly decomposed, is somewhat impregnated with ore, and even contains sheets of ore within itself; but remote from the plane of contact with the limestone, it contains little diffused and no concentrated ore. It is scarcely more pervious than the underlying limestones, and why a solution that could penetrate and leach ores from it should be stopped at the upper surface of the blue limestone is not obvious; nor why the plane of junc-

* See Remond's Report (*California Geological Survey Mining Statistics*, No. 1), where seventy-seven mines are enumerated, of which three are said to be in "porphyritic schist," all the others in granite, mica-schist, clay slate, etc.

tion between the porphyry and the blue limesone should be the special place of deposit of the ore.

If the assays of the porphyry reported by Mr. Emmons were accurately made, and they shall be confirmed by the more numerous ones necessary to settle the question, and the estimates he makes of the richness of that rock be corroborated, an unexpected result will be reached, and, as I think, a remarkable and exceptional case of the diffusion of silver and lead through an igneous rock be established.

It is, of course, possible that the Leadville porphyries are only phases of rocks rich in silver, lead, and iron, which underlie this region, and which have been fused and forced to the surface by an ascending mass of deeper seated igneous rock: but even if the argentiferous character of the porphyry shall be proved, it will not be proved that such portions of it as here lie upon the limestone have furnished the ore by the descending percolation of cold surface waters. Deeper lying masses of this same silver, lead, and iron-bearing rock, digested in and leached by *hot* waters and steam under great pressure, would seem to be a more likely source of the ore. If the surface porphyry is as rich in silver as Mr. Emmons reports it to be, it is too rich; for the rock that has furnished so large a quantity of ore as that which formed the ore-bodies that I saw in the Little Chief and Highland Chief mines, respectively 90 feet and 162 feet thick, should be poor in silver and iron and lead, and should be rotten from the leaching it had suffered; but except near the ore-bearing contact, it is compact and normal.

Such a digested, kaolinized, desilicated rock as we should naturally look for we find in porphyry near the contact; and its condition there, so different from what it is remote from the contact, seems to indicate an exposure to local and decomposing influences; such, indeed, as a hot chemical solution forced up from below along the plane of contact would furnish.

It is difficult to understand why the upper portions of the porphyry sheet should be so different in character, so solid and homogeneous, with no local concentration or pockets of ore, if they have been exposed to the same agencies as those which have so changed the under surface.

Accepting all the facts reported by Mr. Emmons, and without questioning the accuracy of any of his observations, or deprecating in any degree the great value of the admirable study he has made of this difficult and interesting field, his conclusion in regard to the source of the ore can not yet be insisted on as a logical necessity. In the judgment of the writer, the phenomena presented by the Leadville ore-deposits can be as well or better accounted for by supposing that the plane of contact between the limestone and porphyry has been the conduit through which heated mineral solutions, coming from deep-seated and remote sources, have flowed, removing something from both the overlying and underlying strata, and by substitution depositing sulphides of lead, iron, silver, etc., with silica.

The ore-deposits of Tybo and Eureka, in Nevada, of the Emma, the Cave and Horn-Silver* mines in Utah, have much in common with those of Leadville, and it is not difficult to establish for all of the former cases a foreign and deep-seated source of the ore. The fact that the Leadville ore-bodies are sometimes themselves excavated into chambers, which has been advanced as proof of the falsity of the theory here advocated, has no bearing on the question, as in the process of oxidation of ores that were certainly once sulphides, there has been much change of place as well as character; currents of water have flowed through them which have collected and re-deposited the cerusite in sheets of "hard carbonate" or "sand carbonate," and have elsewhere produced accumulations of kerargyrite, perhaps thousands of years after the deposition of the sulphide ores had ceased and the oxidation had begun. In the leaching and rearrangement of the ore-bodies, nothing would be more natural than that accumulations in one place should be attended by the formation of cavities elsewhere.

Another question which suggests itself in reference to the Leadville deposits is this: If the Leadville ore was once a mass of sulphides derived from the overlying porphyry by the percolation of surface waters, why has the deposit ceased? The deposition of galena, blende, and pyrite in the Galena lead mines continues. If the leaching of the Leadville porphyry has not resulted in the formation of alkaline sulphide solutions, and the ore has come from the porphyry in the condition of carbonate of lead, chloride of silver, etc., then the nature of the deposition was quite different from that of the similar ones of Tybo, Eureka, Bingham, etc., which are plainly gossans, and indeed is without precedent. But if the process was similar to that in the Galena lead region, and the ores were originally sulphides, their formation should have continued and have been detected in the Leadville mines. For all these reasons, the theory of Mr. Emmons will be felt to need further confirmation before it is universally adopted.

From what has gone before, it must not be inferred that lateral secretion is excluded by the writer from the list of agencies that have filled mineral veins; for it is certain that the nature of the deposit made in the fissure has frequently been influenced by the nature of the adjacent wall-rock. Numerous cases may be cited where the ores have increased or decreased in quantity and richness, or have otherwise changed character in passing from one formation to another; but even here, the proof is generally wanting that the vein materials have been furnished by the wall-rocks opposite the places where they are found.

The varying conductivity of the different strata in relation to heat and electricity may have been an important factor. Trap dikes frequently enrich veins where they approach or intersect them, and they have often been the *primum mobile* of vein formation, but chiefly, if not only, by supplying heat, the mainspring of chemical action. The proximity of heated masses of rock has promoted chemical action in the same way as do the Bunsen burners or the sand-baths in the laboratory; but no case has yet come under my observation where it was demonstrable that the filling of a fissure-vein had been due to secretion from igneous or sedimentary wall-rocks.

In the Star District of Southern Utah, the country-rock is Palæozoic limestone, and is cut by so great a number and variety of mineral veins that from the Harrisburg, a central location, a rifle-shot would reach ten openings, all on as many distinct and different veins (namely, the Argus, Little Bilk, Clean Sweep, Mountaineer, St. Louis, Xenia, Brant, Kannarrah, Central, and Wateree). The nearest trap rock is half a mile or more distant, a columnar dike perhaps fifteen feet in thickness, cutting the limestone vertically. On each side of this dike, is a vein from one to three feet in thickness, of white quartz with specks of ore. Where did that quartz come from? From the limestone? But the limestone contains very little silica, and is apparently of normal composition quite up to the vein. From the trap? This is compact, sonorous basalt, apparently unchanged; and that could not have supplied the silica without complete decomposition.

I should rather say from silica-bearing hot waters that flowed up along the sides of the trap, depositing there, as in the numerous and varied veins of the vicinity, mineral matters brought from a zone of solution far below.

To summarize the conclusions reached in this discussion, I may repeat that the results of all recent as well as earlier observations have been to convince me that Richthofen's theory of the filling of the Comstock lode is the true one, and that the example and demonstration of the formation of mineral veins furnished by the Steamboat Springs are not only satisfactory, but typical.

* The Horn-Silver ore-body lies in a fault-fissure between a foot-wall of limestone and a hanging-wall of trachyte, and those who consider the Leadville ores as leachings of the overlying porphyry would probably also regard the ore of the Horn-Silver mine as derived from the trachyte hanging-wall; but three facts oppose the acceptance of this view, namely, 1st, the trachyte, except in immediate contact with the ore-body, seems to be entirely barren; 2d, the Horn-Silver ore "chimney," perhaps fifty feet thick, five hundred feet wide, and of unknown depth, is the only mass of ore yet found in a mile of well-marked fissure; and 3d, the Carbonate mine opened near by in a strong fissure with a bearing at right angles to that of the Horn-Silver, and lying entirely within the trachyte, yields ore of a totally different kind. Both are opened to the depth of seven hundred feet with no signs of change or exhaustion. If the ore were derived from the trachyte, it should be at least somewhat alike in the two mines, should be more generally distributed in the Horn-Silver fissure, and might be expected to give out at no great depth.

If deposited by solutions coming from deep and different sources, the observed differences in character would be natural; it would accumulate as we find in the channels of outflow, and would be, as time will probably prove it, perhaps variable in quantity, but indefinitely continuous in depth.

EXPERIMENTS IN MAKING COKE FROM NON-CAKING COAL.

Two years ago, the management of the iron-works at Trzynietz, Silesia, Austria, had to grapple with the problem of making good coke for a blast-furnace out of coal that was very pure, but which possessed few or no caking qualities. The experiments made to meet this emergency led to a novel expedient, which holds out so much of promise that we reproduce below the preliminary account published in a recent issue of the *Oesterreichische Zeitschrift für Berg- und Hüttenwesen*. The coke produced from this coal in the ordinary manner in Gobiet ovens was poor and tender. The greater part of it fell to pieces, so that it was not fit for use in the furnace, especially because fine ores had to be smelted. In order to get over this difficulty, the washed coal was crushed previously to coking, but the result was not favorable. The structure of the coke was uniform, but it possessed no resistance, and even then 40 per cent of dust was obtained. In order to attain the object aimed at, different systems of ovens, which work hot and which are narrow were tried, among them the Appolt oven. No appreciable improvement of the quality of the coke was reached. The crushed coal was mixed, also, with agglomerating materials like tar and pitch, and no better results were obtained with such expensive additions.

Meanwhile experiments were carried out on a small scale to attain the desired object in another way. The leading idea was, that non-caking coal develops only so small a quantity of tar during the coking process that it does not suffice to fill the interstices between the particles of coal and to bind them strongly together when the tar expelled is decomposed. This opinion was led to by the observation that crushed coal furnishes coke that is even more tender than coal that has not been crushed. This, it was argued, was due to the fact that the crushing considerably increases the number of interstices in the oven charge. It has been observed by others that crushing impairs the caking qualities of coal; but this fact was attributed to a partial escape of volatile matter during the process of crushing.

In order to get along with the agglomerating material that is expelled from the coal itself during the coking process, the object became to reduce the volume of the interstices between the coal by stamping it together before charging it into the oven, since the addition of tar was not successful, probably because a part of the agglomerating material added may be volatilized previous to the beginning of the coking.

The experiments with coking compressed coal were begun in January, 1883, and proved successful at once. The samples of non-caking crushed coal compressed or stamped into sheet-iron receptacles when heated in reverberatory furnaces or in coke-ovens, showed without doubt that this method, if practically carried out on a large scale, would lead to satisfactory results.

The first trial on a large scale was carried out in the following way: Crushed coal was stamped into a wooden box, the inside dimensions of which were approximately equal to the inside dimensions of the coking-oven. The side walls of this box were made removable, and its bottom was formed by an iron plate. So far as the compressing of the coal was concerned, the following observations were made: When the coal was filled in to a depth of 3 feet, the charge was compressed by 15 per cent of its original depth, or the volume of the interstices was reduced from 35 per cent of the total volume of the charge to 20 per cent. When, however, the same quantity of coal was stamped down in three equal layers, the original depth was diminished by 22 per cent, and the volume of the interstices was carried down from 35 to 13·5 per cent. This shows that greater success may be obtained by increased compression, and that the interstices which hinder the caking of the coal may be reduced to a minimum volume.

After the charge was stamped into the box, the sides and ends of the box were removed and the cake of coal was got into the oven by means of the pusher and a hook attached to the iron bottom. At first, of course, the cake of coal did not touch the side walls of the oven, but it rested upon them gradually during the process of coking. The coking itself, while not being materially retarded, is uniform. In the beginning of the process, the escape of gas is not so violent, being distributed more uniformly over the whole coking period. After its completion, the cake of

coke is pushed out with the bottom plate, which comes out of the oven without being damaged.

The whole of the coke, in all the trials thus far made, has proved to be a solid product, leaving little fine coke. It was produced from coal which with the ordinary coking process yielded coke totally unfit for use in the blast-furnace, and not capable of being transported. As favorable a result as that obtained by stamping or compression can not be obtained by pressure upon the charge. With coal of greater caking qualities, there is some use in stamping the surface of the charge by means of an apparatus consisting of a lever to one end of which an iron plate is attached. This plate is introduced into the oven, and thus one half of the surface of the charge may be stamped down from each end of the oven. In the case of good caking coal, this method of compressing the charge is decidedly successful, because with the ordinary method of charging coal the upper part of the cake of coke in the oven is always tender.

When non-caking coal is used, it will not suffice to stamp in the oven with the apparatus described, nor to press the coal into it before coking by means of the pusher, nor to exert static pressure upon the charge by keeping on it during the coking cast-iron plates or layers of fire-brick. These methods are of little avail, because the compression in the first instance reduces the volume of the interstices too little and acts only on the surface, leaving the middle portions a loose mass. The employment of the pusher, on the other hand, does not compress the upper part of the charge, which needs it most, except in the case of ovens so designed as to admit of charging to the very roof, and then many ovens would not stand the strain. The third method, static pressure, has been shown by experience to be insufficient. A pressure of 50 *q* per square meter on a 3 meter column of crushed coal reduced its hight only 12 per cent.

Another experiment was to supplant the method of compressing the coal outside of the oven by rolling it down in layers in the oven. A roller 600 millimeters long and 400 millimeters in diameter, weighing 250 kilograms, was used. The compression was insufficient, and there were other difficulties besides.

The varied and long continued experiments at Trzynietz have proved that by coking strongly compressed coal, it is possible to make from a non-caking material dense uniform coke, in pieces with little fines. The time for coking, according to experiments thus far made, is not materially increased, and as the ovens remain uniformly hot, the brick from which they are made are not much attacked, so that a poorer grade may be used. It is probable that less stress need be laid upon having the ovens work very hot—so far, at least, as the requirements of good quality of coke demand it. This appears to be of some importance, because the high-grade refractory material needed is not always to be obtained, although in other respects the designing of ovens working at a high heat has made great progress.

According to the experiments thus far made, the total yield of coke from compressed coal is from 3 to 5 per cent higher than with the ordinary coking process without preliminary compression of the charge. In itself, this method does not call for any change in the existing ovens, being applicable to all horizontal ovens without exception. It is probable that small quantities of coke breeze may be added to the charge of coal before compression, and that it is possible to utilize the coke breeze profitably in this manner. It may be urged, also, that probably suitable dense lump coke may be made from crushed compressed lignite, and that this object would be aided considerably by using small quantities of an agglomerating material like tar or pitch. It may be concluded without a doubt that the volatilization of the agglomerating material in the coking process is retarded by charging compressed coal.

THE DISTRIBUTION OF STEAM IN CITIES.

In reply to criticisms on the distribution of steam in cities, contained in a paper by W. A. Goodyear, read before the Boston meeting of the Institute of Mining Engineers, Mr. W. P. Shinn has, in a communication to the Institute, given some facts that are of general interest. We quote the following from his paper:

The system of steam distribution invented by Birdsill Holly, M.E., has been in successful operation in Lockport, New York, for heating only, for seven years. The company has four and a half miles of main, six 75 horse-power boilers, and supplies over two hundred consumers. During the first four years, it was operated without meters, at a loss. When meters were adopted, three boilers were sufficient to supply the customers who formerly required the steam from six. The capital of the company is $50,000, and it is earning net from 20 to 25 per cent per annum. The largest main is 4 inches in diameter, and the pressure carried is from 30 to 35 pounds.

In Springfield, Mass., the system has been in use for five winters, for heating only. The company has two and a quarter miles of mains, and eight 75 horse-power boilers. The pressure carried is from 20 to 40 pounds. The company has 196 consumers, and on an investment of $50,000, has earned net from 12 to 15 per cent per annum, since the second year. The steam is sold by meter, and readings are taken weekly.

In Dubuque, Iowa, the system has been in operation for five winters, with two and one eighth miles of mains, and seven 50 horse-power boilers. The company is supplying 250 horse-power of steam to 140 consumers for heating purposes only. The plant was constructed too cheaply, and has not been a financial success. It is now earning a small surplus, and consumers are all delighted with the service.

In Denver, Colorado, the system has been in use during four years, for heating only. The company has nearly three miles of eight, six, four, and three-inch mains, and fifteen 50 horse-power boilers, supplying 150 consumers. Upon an investment of $150,000, the company earned net, during the season of 1882–83, $7863, or $5\frac{3}{16}$ per cent, and the net savings for the season of 1883–84 were estimated at $10,000, or $6\frac{2}{3}$ per cent.

In Hartford, Conn., a steam-plant has been in operation during four seasons, with nearly two miles of 6-inch, 4-inch, and 3-inch mains, and twenty 80 horse-power boilers. This company carries 60 pounds pressure, and supplies 150 consumers, principally for heating. The plant was poorly constructed upon plans designed to evade the Holly patents, and has not been profitable, but is paying expenses, and improving in its results.

In Lynn, Mass., a "duplex system" was put in operation in February, 1881, and was run until July, 1883. This plant had a high-pressure main in which 70 pounds pressure was carried, and a low-pressure main-carrying 20 pounds, the former being used for power and the latter for heating. I personally examined this plant in October, 1881, and again in June, 1882, and found it working successfully and giving great satisfaction to its customers for power, the only ones then using the steam. The plant was poorly constructed, the boiler-house was badly located, and the company failed financially; and in July, 1883, the plant was sold to a company, to be used for the distribution of water-gas. It has been so used during the heating season just ending, with a less favorable result than was reached by the steam company.

In New Haven, Conn., a company has been in operation for two seasons, with about two miles of 8-inch, 6-inch, 5-inch, and 4-inch mains, and ten 75 horse-power boilers. The plant was constructed on the "duplex plan," and during the first season furnished both power and heat; but during the past season it has furnished 500 horse-power of steam to 80 consumers for heating only. The financial results have been bad, the earnings having failed to pay expenses, principally on account of bad management.

In Troy, N. Y., and Detroit, Mich., steam-plants have been in operation from three to four years: but I have no definite information as to their results.

In Milwaukee, Wis., a plant was constructed and operated during two winters; but owing to faulty construction and still worse management, it was a financial failure; and it has not been in operation during the last two seasons.

The New York Steam Company, after two years spent in making plans and trying experiments in expansion-joints and in non-conducting materials, began building its first boiler-station in the summer of 1881, and commenced laying street-mains in September, 1881.

The company now has its boiler-station (B) on Greenwich street above Cortlandt, in this city (a building 75 by 100 feet on the ground, with a basement and three stories complete, and the fourth story covered by a temporary roof), containing 31 Babcock & Wilcox 250 horse-power boilers, of which there are on the first floor 4, on the second floor 12, and on the third floor 15. The fourth floor contains the coal-bins, the coal being hoisted in cars, upon a platform-hoist, and descending in chutes to the floor, alongside each boiler. The building is designed to be six stories, or 120 feet in hight above the basement, and is to contain 64 boilers of 250 horse-power each, 16 on each of four floors, the fifth and sixth stories to be in one, to contain Green's economizers, and storage for one thousand tons of coal. The total capacity of the station will be 16,000 horse-power, requiring a daily consumption of from 600 to 750 tons of anthracite coal. Draught will be furnished by two chimneys, each 27 feet 10 inches by 8 feet 4 inches interior section, and 217 feet high above the basement-floor. The grant to the company covers the right to lay its pipes in "every street, alley, and public place" in the city of New York, which contains over 250 miles of paved streets; and the company now owns the property for ten boiler-stations, distributed on both sides of the city, from near the foot of Broad street to Fifty-sixth street. The system of mains consists of a steam-main of from 6 inches to 16 inches in diameter, and a return water-main of from $2\frac{1}{2}$ inches to 8 inches diameter, the former laid between brick walls, and surrounded by from 6 inches to 12 inches of mineral wool, and the latter laid in hollow logs, with a space of 3 inches around the pipes, also filled with mineral wool. The pipes are laid with an anchorage every 90 to 100 feet, and a double expansion-joint midway between the anchorages—or with an anchorage and single expansion-joint every 45 to 50 feet. The expansion-joint is of the diaphragm style, invented by Mr. Emery for this company's use.

The mains now laid are as follows:

Steam mains.		Return water-mains.	
Of 16 inches	746 feet.	Of 6 inches	5,037 feet.
15 "	9,884 "	5 "	1,155 "
13 "	1,683 "	4 "	11,900 "
11 "	4,147 "	$2\frac{1}{2}$ "	3,800 "
8 "	1,091 "		
6 "	5,802 "		
Total	23,353 feet.	Total	21,892 feet.

Or 4·42 miles of steam-mains, and 4·14 miles of return mains, in all 8·56 miles of pipes, exclusive of service-pipes. The most distant point to which steam is now delivered is 3359 feet from the boiler-station; and the other extremities are 3187, 3133, 3044, 2973, 2920, 2880, 2625, 2261, and 2077 feet respectively, from the boiler-station. The pressure carried is from 75 to 85 pounds at the boiler-station, and carefully conducted tests show the pressure at the extreme points to be from $1\frac{1}{2}$ to 2 pounds less than at the boiler-station. The company has been furnishing, during March, 1884, 4156 horse-power of steam to consumers, of which 1985 horse-power was for power, 2171 horse-power for heating and other purposes. Engines are run of from 1 to 150 horse-power, and the supply of steam is regular, constant, and satisfactory. The amount of capital actually invested in the Station B and its street-system is $1,086,320.79. Only one half the capacity is at present utilized; but the operations are now on a paying basis, the net earnings being at the rate of $20,000 per annum, or about 2 per cent of the cost, and this in the second year of operation. When Station B is operated at its full capacity, much greater economy will be realized, and its net earnings are expected to be from 15 to 20 per cent on the amount of the investment in that part of the company's system.

I claim, therefore, that the system of street distribution of steam in cities is not a failure, but that, considering the limited time for which it has been tried, it is a decided—an *unusually* decided—success.

ELECTRIC LIGHT PATENTS.—The Brush Electric Light Company brought a suit against certain parties using the Weston Electric Light apparatus, and the case has been tried before Judge Shipman in the United States Courts. The proceedings occupied nearly four years, the defendants being the United States Electric Light Company, which manufactured the apparatus. The suit was brought upon two patents granted to Charles F. Brush, one for metal-plated carbon points and the other for an improved electric lamp. The plaintiffs withdrew the carbon patent before the case was closed, and Judge Shipman has handed down a decision holding that the lamp patent is invalid and void, and dismissing the bill with costs as to both patents.

THE HIGHT OF BLAST-FURNACES.

A correspondent of an English technical paper says: Some arguments against an excessive hight in blast-furnaces are given in a letter addressed by an iron-master to a continental contemporary. After referring to the high production of the Ulverston furnaces, which are only 46 feet high, he recalls an interesting fact that occurred during the Franco-Prussian war, at Saarbrücken. Owing to the scarcity of fuel, only one furnace, 14 meters or 46 feet high, could be kept going, but all the blowing-engines supplied this one furnace, with the result that the production was increased from 40 to 70 tons per twenty-four hours. He contends that if a furnace 16 meters (52½ feet) have the same dimensions at the bottom as a furnace of 20 meters (nearly 66 feet), with a blowing-engine giving the same quantity and pressure of blast, the production will be equal.

The dimensions recommended are a hight of from 14 to 16 meters (from 46 feet to 52½ feet), a shaft of from 4 to 6 meters (from 13 feet to 20 feet) and a wide mouth. The advantages claimed for such a furnace are as follows: (1) economy in construction and in working; (2) less waste of fuel, which, in a very high furnace, arises from a too prolonged contact of the coke with the ore and flux; and (3) great regularity of working, as the gases are less compressed and better distributed among the various substances.

An excessive hight is also said to be productive of more than one disadvantage. A difference of 4 meters (13 feet) in hight for a diameter of the same dimensions, represents a content of about 64 cubic meters (2260 cubic feet), weighing approximately 57 tons. This, added to an intense pressure of blast, exerts a great strain on the inside of the furnace, and especially on the hearth, which often contains 20 tons of molten iron, and thus frequently causes an infiltration or penetration of the iron into the joints of the hearth and foundations, where it forms masses difficult of removal. This trouble may be avoided by constructing the hearth of wrought-iron plates about 4 inches thick, lined inside with fire-brick, and laid on a bed of sand kept cool by a stream of water. But there is still another disadvantage of an excessively high furnace. Internal explosions, which are due to a stoppage in the descent of the charge, are naturally the more dangerous as the hight is greater, and if the mass above, which closes the mouth, offers more resistance than the sides, the furnace must give way. As a preventive of explosions, it is recommended to change sometimes the working of furnaces from one class of pig to another.

COPPER ANALYSES.—Herr O. Pupahl, of the Berlin School of Mines, has published the following analyses of different brands of copper:

	Wallaroo.	Calumet & Hecla.	Mansfeld.	Bede Metal Co.	"Grange" (English).
Copper	99·795	99·864	99·491	99·148	98·961
Oxygen	0·127	0·120	0·145	0·090	0·160
Lead	0·004	.....	0·038	0 024	0·005
Iron	0·001	trace.	0·001	0·001	0·004
Nickel	0·039	0·002	0 201	0·081	0·066
Silver	0·015	0·028	0·031	0·058	0·010
Gold	.....	trace.	.....	trace.	.....
Sulphur	.....	.....	.....	0·005	trace.
Arsenic	.....	trace.	0·072	0·600	0·766
Antimony	.....	.....	trace.	0·002	0·011
Total	99·981	100·014	99·979	100·008	99·98

FURNACE, MILL, AND FACTORY.

The Omaha & Grant Smelting and Refining Company is adopting the independent system of power. It has recently put in two Westinghouse engines of 80 horse-power each.

The Illinois Malleable Iron Company, at Chicago, Ill., has been incorporated with a capital stock of $25,000. The incorporators are Henry E. Bullock, G. W. P. Atkinson, and Byron C. Bradley.

Carmichael & Emmens, dealers in iron, of No. 130 Cedar street, this city, have made an assignment to Frank E. Smith, preferring the Laurel Iron-Works for notes indorsed by Andrew Williams, and also notes issued by the Coatesville Iron Company, indorsed by the same. William J. Carmichael and Abraham W. Emmens are the members of the firm, which was formed in April, 1881, succeeding Carmichael, Emmens & Worth. The firm owned a controlling interest in and operated the Coatesville Iron Company, of Coatesville, Pa., and the Laurel mill of the same place, and the Union Tube-Works of New-Castle, Pa. The depression of the iron trade and the inability to relieve themselves of their foundries are the principal causes of their assignment.

The Phœnix furnace of Brown, Bonnell & Co., Youngstown, Ohio, has been shut down for the present, having over 5000 tons of pig-iron in stock. The Falcon is still in operation. When all the mills were running full, it required the combined product of the Phœnix, Falcon, and Struthers furnaces to supply them with pig-iron.

The mills of the Mahoning Valley Iron Company and Youngstown Rolling-Mill Company, Youngstown, Ohio, are on "double turn," and running to their full capacity, while the other mills in the city are on "single turn." A dispatch to the New York *Tribune* says that a gentleman interested in blast-furnaces said of the market: It is decidedly quiet, but we intend to run as long as any one will trust us for ore. The ore has been contracted for, and it is certainly better to work it up into metal than to have it lying in the stock-house. There never has been a time in the country when pig-iron could be produced at as low a cost as at present, and if I had a million dollars, I would invest it at once in pig-iron, as I am satisfied that in a short time it will be worth a good deal more than at present. It seems to me that the bottom in prices has been reached.

The Bellevue-Idaho Mining Company has recently purchased a 30 horse-power Westinghouse automatic engine for its concentrating works.

In a recent issue, we stated erroneously that the National Tube-Works Company, whose works are at Boston and at McKeesport, Pa., had reduced its capital stock from $500,000 to $150,000. The capital of the company is $2,500,000, all paid in in cash.

Messrs. Skinner & Wood, of Erie, Pa., who have recently opened an office at No. 45 Dey street, in this city, have issued a catalogue showing their portable engines, ranging from 5 to 20 horse-power, and their small stationary engines with counterbalanced wrought-iron cranks. They make also a return-flue portable boiler with hollow fire-bridge, and locomotive and stationary tubular boilers. Among their specialties, is the Skinner automatic stop-governor and an improved stuffing-box. The catalogue is fully illustrated and handsomely printed.

The plow manufacturing firm of B. D. Buford & Co., of Rock Island, Ill., made an assignment, July 14th, with liabilities estimated at $200,000, of which about $150,000 is in trust deed to W. H. Singer, of the iron and steel firm of Singer, Minnock & Co., of Pittsburg, Pa.

It is stated that cadmia or oxide of zinc deposits have taken place in the tunnel-head or upper portion of the stack of the Low Moor Furnace, Pa., since it has been using for part of its stock iron ore obtained from the mine of the Alleghany Iron Mountain Company, necessitating at times a stopping of the furnace to break off these zinc accumulations from its throat. These deposits did not occur until the Alleghany Iron Mountain ores were used.

Ground has been broken at the Colebrook Furnaces, at Lebanon, Pa., for a new furnace. This will be the third furnace erected at this place within three years by Robert H. Coleman.

The Chicago Concentrating and Smelting Company, at Bingham, Utah, has contracted with Parke, Lacy & Co., for a 30 horse-power Westinghouse automatic engine.

James Edwards & Co., of New York, the well-known builders of centrifugal pumps, are building a novel dredging-machine for the Okeechobee Land and Improvement Company, to be used in draining the swamps of Southern Florida. It consists of a huge pump, mounted on a float, and driven by a direct-coupled Westinghouse engine of 125 horse-power, making 300 turns a minute. At the outboard end of the suction-pipe, is a series of revolving knives, which stir up the sand and mud, which, when in suspension, is sucked up by the powerful current, and discharged over the dike. This plan has elsewhere proved very efficient.

The recent visit to Europe of Mr. T. Dunkin Paret, the President of the Tanite Company, Stroudsburg, Pa., completed arrangements by which its European trade will be doubled during the coming year, and shortly after be quadrupled. In view of this fact, and of the successful business transacted this year, the company is arranging for a large extension of its factory. This factory was started in the year 1867 by the erection of a stone building 45 feet long and 32 feet wide, two story and attic, with boiler-shed extension. The total floor room of the original buildings amounted to 5550 square feet. The flooring used at the present time is 34,190 square feet. The new building, for which preparations are now making, will be an extension of the original stone building, and will be of the same size. In order to extend and more thoroughly control the water-power, and to secure timber and stone for further operations, the company bought last month from Mr. Robert Huston, his farm of 130 acres that adjoined the company's original property. On the property recently purchased, the company is cutting timber for the preliminary work connected with the improvement of its water-power. A new breastwork, cribbing, and flume are to be erected at the dam, and new fore-bay and penstock at the factory. The factory has, in addition to its steam-power, a 42-inch Jonval turbine, but in the new penstock, a 24-inch Stevenson duplex turbine will be added, and by means of these three motors the various departments can be run independently when desired. During the last summer, the company put in operation a complete fire system. Iron pipes are laid underground all around the buildings, and are connected with three pumps situated in different buildings, one detached: one double-acting Worthington steam-pump, one Niagara steam-pump, and one powerful pump, run by water-power. Five plug or hose-houses stand scattered around at a safe distance from the buildings, containing in all twelve plugs or nozzles, and 650 feet of 1½-inch and 200 feet of 2-inch hose. Fire-axes are in all these houses, and fire-pails and axes liberally distributed through the buildings. Streams of water have been thrown upon the buildings in one minute and twenty seconds after the first signal was given.

Edwin M. Ivens & Son are doing a heavy business in centrifugal pumps for drainage and irrigation. They have built new shops in New Orleans, and report themselves as overrun with orders. Their pumps are all driven by direct connection, the engine being coupled directly to the pump-shaft, and making from 300 to 500 revolutions, according to the service to be performed. For this purpose, the Messrs. Ivens use the Westinghouse engine exclusively, dispensing with belts. During the spring floods, they ordered their engines from the makers in Pittsburg by the car-load, until their stock was completely exhausted, but were still unable to supply the demand. The dry season is equally prolific of business in this line, for irrigation. Indeed, a sugar plantation may be said to be in a chronic state of pumping—pumping in, or pumping out.

The failure of Dawson Brothers, manufacturers of mills and mill machinery, in Wilmington, Del., is announced. Liabilities, $60,000; assets, $14,000.

The North Chicago Rolling-Mill Company reports the business for the first half of this year as exceeding by from 10 to 15 per cent that of the last half of 1883, with indications of reasonably full work the present half-year. The steel rail output is now from 1000 to 1200 tons a day; bar iron, 100 tons; and nails, 1000 kegs. The production of pig is 1000 tons daily, all of which is used by the company. The nail mill (at Milwaukee) was erected this year, and a plant for the manufacture of steel girders, beams, etc., is under way.

Totten & Co., of the Fulton foundry and machine-shops, Pittsburg, are at present very busy. An order for sixteen and ten-inch trains of grooved rolls for making all kinds of merchant iron is filling for the Burlington Iron Company, at Burlington, Iowa. A large engine is making for a rolling-mill in Green Castle, Indiana. All the machinery is now making for the Ironton, Ohio, rolling mill, which was burned some months ago. A large order of all kinds of rolling-mill machinery has just been completed and shipped to a new rolling-mill at Keewanee, Illinois.

The Westinghouse Machine Company has just built for the furnace of J. E. Thropp & Co., of Edge Hill, Pa., a portable outfit for crushing ore and slag. It consists of a flat car, on one end of which is mounted a Westinghouse water-tube boiler, and on the other a Gates crusher, to which is coupled directly a 30 horse-power Westinghouse engine, the coupling piece being made to serve as a breaking piece as well. A friction-gear also connects the engine with one of the car-axles, and the car is, therefore, self-propelling at will.

The New Jersey Iron and Steel Company, of Trenton, N. J., has received an order for 10,000 tons of structural iron, to build a 4½-mile elevated railroad in Brooklyn.

RAILROAD NEWS.

The published report that an understanding has been reached between the Rochester & Pittsburg, the New York, Lake Erie & Western, and the Buffalo, New York & Philadelphia railroad companies on their bituminous coal business is officially denied. No arrangement whatever has been concluded between these companies, and there is no prospect of an amicable agreement being reached soon.

The President of the Norfolk & Western Railroad Company authorizes the following statement: The dispatch from Lynchburg, Virginia, dated July 10th, to the effect that the work on the Cripple Creek extension of the Norfolk & Western Railroad has been suspended for want of funds to pay contractors, is not true. Before the company began work on the Cripple Creek extension, it sold $1,500,000 of improvement and extension bonds with which to pay for this and other new work. The syndicate that took them had an option on $1,000,000 more, which, if taken, would furnish ample means to complete the contemplated improvements. The company determined that no work should be done beyond what was provided for in cash in this way. Owing to the present financial depression, the last $1,000,000 of bonds have not been negotiated, and the company has stopped the work until the funds for its completion are assured by the sale of the $1,000,000 of bonds referred to. The contractors have been promptly paid, and are in funds to pay laborers and sub-contractors. The company is abundantly able to meet all the obligations.

The new road projected by William H. Vanderbilt and ex-Senator William A. Wallace into the Clearfield coal regions, is in operation for fifty miles. The mines along the road are producing 1500 tons of coal daily, which is shipped to New York and Philadelphia.

The statement of the financial condition of the Philadelphia & Reading Rail-

road company, which is now in course of preparation by the accounting officers, will not be completed for a week or ten days at the earliest. The company gives notice that it will purchase on and after July 21st, 1884, the July, 1884, interest and coupons of the following divisional coal land mortgage bonds of the Philadelphia & Reading Coal and Iron Company guaranteed by the Philadelphia & Reading Railroad Company, at the rate set opposite the names of the respective tracts, it being understood and agreed to on the part of the receivers that the principal of all the said bonds and all after-accruing interest thereon shall retain priority of lien over the coupons and interest so purchased: Brady, Gray, and Wetherill tract, due July, 1884, 6 per cent; Eagle Hill Ravensdale Oil Camp and West Flowery Field tract, due July, 1884, 6 per cent; Lee Lands and Oak Hill tract, due July, 1884, 6 per cent; Mount Carmel, Locust Mountain Coal Company tract, due July, 1884, 6 per cent; St. Clair tract, due July, 1884, 5 per cent; Locust Mountain Summit Improvement Company tract, due July, 1884, 5 per cent; Catharine Groh tract, due July, 1884, 5 per cent; Tamaqua tract, due July, 1884, 4 per cent; Minersville tract, due July 1884, 4 per cent; Diamond tract, due July, 1884, 4 per cent; Coal Hill tract, due July, 1884, 4 per cent; Gunkel and Braham tract, due July, 1884, 4 per cent; Valley Furnace tract, due July, 1884, 4 per cent.

The land sales of the Union Pacific Railroad for the month of June were 452,898 acres for $928,641.

LABOR AND WAGES.

The Collector of Customs for the District of Arizona has informed the Treasury Department that the Mexican government has entered into an agreement with a steamship company to give a bonus of $60 a head for Chinese laborers, to be landed at Guaymas, Mexico, under a labor contract.

A cablegram from London states that the colliers having refused to accede to the arbitrators' decision in favor of a reduction, Lord Dudley has closed the Stafford coal-pits.

A delegate meeting of the Miners' Amalgamated Association of the anthracite coal regions was held at Pottsville, Pa., July 15th. About forty branches were represented. Patrick Conroy, ex-member of the Legislature, was elected president, and Matthew Morris, of Luzerne County, secretary. The situation was freely discussed, and it was resolved to send a delegate from each branch to the State Convention that meets in Pittsburg on the 23d inst. A coalition between the bituminous and anthracite miners will then be effected.

The Reading Company completed its payment of May wages July 15th, after disbursing $800,000. The June payments will be made on July 25th, and will take $1,000,000.

The operators in the Hocking Valley, Ohio, Mining District, who went to work with the Italian laborers sent from Chicago recently, have as yet had no trouble with the striking miners. About 130 of Pinkerton's police are on duty about the mines to guard the workmen, and the operators expect to have all at work July 16th. The striking miners look with much disfavor on the presence of the police, and soon after they went on duty, the miners telegraphed to Governor Hoadly, asking him to order out the State troops to protect the citizens from the Chicago sharpshooters, or to issue an order compelling them to lay down their arms. A message of a like character was also sent from New Straitsville, the other having been sent from Nelsonville. The governor replied that he could not order out the troops until there had been some boisterous demonstrations, which he hoped would be averted. No arrests have been made, but the miners have taken legal advice, with the hope of having the detectives disarmed. A mass-meeting of the miners was held July 15th, at which they agreed to go to work in the Rend's and Hayden's mines at seventy cents, if the union would allow them to do so. This is in opposition to the orders of the district meeting held some time ago. A committee was appointed to visit Shawnee, Nelsonville, and other places, and see if the miners at those places would permit them to go to work on the conditions named. The operators state that they will have 3000 more foreigners to go into the mines in a few days.

Reports from Nelsonville, dated July 16th, state that half of the number of Italian miners employed in the Brooks mine left this morning, and it is rumored that the rest will come out. Great excitement prevails in the valley to-day.

COAL TRADE NOTES.

CANADA.

CAPE BRETON, NOVA SCOTIA.

The daily output of the Reserve mines is now about 700 tons. At the Lingan mines, work continues brisk. A large amount of coal was shipped during June.

DAKOTA.

At Jenks's farm, three miles from Yankton, a vein of coal has been struck at a depth of 240 feet. The drill is four feet in the coal formation. Before reaching this depth, the drill passed through four thinner layers of coal—one at 90 feet, one at 120, one at 170, and one at 220 feet. The product resembles cannel coal, and burns readily, leaving few ashes. A shaft will be sunk.

ILLINOIS.

The Knights of Labor have purchased and are operating through their executive committee several large coal mines in Central Illinois.

INDIANA.

The mines in the Brazil District are not averaging over one-fourth time now. The markets are well filled up. Some of the mines do not run more than one day a week.

MARYLAND.

Reports from Frostburg under date of July 7th state that work at the several mines in this immediate neighborhood continues a little dull. None of the mines for the past few days has been working full-time. The work on the extension to the Hoffman slope is progressing very satisfactorily. It is driven at the rate of 22 feet every twenty-four hours. The Ocean new slope will be driven to the desired depth by the middle of this month. This new opening at the Ocean is destined to become one of the most extensive mine openings in this section.

According to Cumberland papers the opening of navigation on the canal is more promising than for some time. The Borden Company has resumed shipping; the Maryland will ship all the season; the American will also run its boats, and there is generally an outlook for largely increased canal shipments during the remainder of the season.

MEXICO.

San Francisco papers report the discovery of two large bodies of anthracite coal in Northern Mexico.

OHIO.

At Chapman, the work is not very encouraging. Sippo mine is going slowly. Willow No. 5 has started up again, after being idle since New Year's. The new shaft of Burton, Ridgeway & Co. is steadily going down.

The Leadville shaft at Weathersfield remains idle, with no prospect of resuming. The mines at Mineral Ridge are doing nothing. The Pine Hill mine is played out. The present company pulled up stakes and abandoned it.

PENNSYLVANIA.

ANTHRACITE.

The pump at the old slope of the Peerless colliery, Shamokin, is in operation, raising water from the mine, which has been flooded for some time.

The test-holes driven at the Pottsville shafts have proved so successful that proposals have been invited for driving a continuation of the west gangway fifty yards farther. It is believed that before many weeks the coal will be found in large quantities, and the success of the colliery will, after years of patient waiting and the expenditure of thousands and thousands of dollars, be established.

The contract for driving a plane from the Baltimore to the Hillman vein in the Stanton colliery of the Lehigh & Wilkes-Barre Coal Company, has been let and operations begun. The plane, when completed, will be fully eight hundred feet in length, and eight by sixteen feet in dimensions. The contract had been undertaken by others, but they were unsuccessful, having finished only about 180 feet of it.

BITUMINOUS.

The Barclay Coal Company reports $6155 as rent of railroad and royalty on coal for the month of June.

COKE.

There is not much to be said about the coke trade, says the Connellsville *Courier*. Of the 9820 ovens in the region, exclusive of those in the Pleasant Unity and Latrobe districts, there are idle 2587, or about 27 per cent of the whole. This includes the 25 per cent shut down of the coke pool. The other idle ovens, amounting to 873, embrace 132 of the independent ovens, 372 furnace ovens, and the 369 ovens that have been idle for the past year. Compared with our report of two weeks ago, this shows an increase of 100 idle ovens, and indicates a weaker market. Prices remain as usual and cars are plenty.

The Mount Braddock coke-works will shortly be sold at assignee's sale.

NATURAL GAS.

The drillers at the American Iron-Works, Pittsburg, have begun operations. It is the intention to go down 4000 feet, if gas is not struck before. On the south bank of the Monongahela, a short distance below this well, Chess, Cook & Co., Anchor Tack-Works, have a derrick up, and will soon start the drill. The only well going down at Hulton, Alleghany Valley Railroad, is on the Caleb Lee farm. A heavy vein of gas was struck here, July 16th, at the depth of 800 feet This is in a new field, and the pressure is said to be strong.

The Tarentum Heat and Light Company has completed the drilling of another gas-well at that place. At the depth of 1100 feet, a strong vein of gas was struck, and work was stopped. The well is not as strong as the last one drilled by the company, but is considered a good well. It will be tubed, and the company expects to utilize the gas in heating and lighting the town of Tarentum.

The gas struck on the Bandy Farm, Bull Creek District, Tarentum, by Guffy, Gally & Co., is the heaviest flow yet got, the pressure having shown over five hundred pounds to the square inch. This well is in addition to the one mentioned above. Both are on the forty-five degree line.

The drill at the Thirty-first street well of Park Brothers & Co. has been in operation over a week. It has attained a depth of 450 feet. At a depth of 190 feet, a vein of good coal no less than 17 feet in thickness was gone through. This alone, being so near the surface, is an exceedingly valuable discovery, equal as it is to nearly three quarters of a million bushels an acre. From 207 to 380 feet of slate were found, which was easy to drill; then for 20 feet, the drill went through sand; and for the last 50 feet, hard slate, at which the drillers are still at work.

Natural gas at the Westinghouse well exploded from a leak, July 14th, seriously injuring two drillers. Both men were terribly burned, and, it is feared, are injured internally. The derrick took fire, but was saved.

The Perrysville Natural Gas Company, one of the numerous corporations engaged in boring for gas in the vicinity of Pittsburg, has struck oil at a depth of 1900 feet. The well is located within twelve miles of the city limits.

In the Zimmerman well, at Brushton, gas was found July 14th at a depth of 600 feet. Four other wells are expected to reach the vein in a few days.

A heavy flow of gas has been struck on Miller's farm, two miles from the McGurgan well, at a depth of 1100 feet.

VIRGINIA.

Clarence H. Clark, Esq., of Philadelphia, has presented to the town of Pocahontas a very tasteful structure, costing about $1600, which contains a reading-room, called the Clark Library, coupled with a public school-room. Mr. Clark has generously furnished both rooms in a handsome manner and stocked the reading-room with 300 volumes of assorted literary books. The Southwest Virginia Improvement Company will add to the attractiveness of the reading-room by furnishing leading Philadelphia and New York dailies and various illustrated and weekly publications. The company has also erected at its own cost a $1000 school-house for colored children.

WEST VIRGINIA.

It is understood that the Atlantic & George's Creek Consolidated Coal Company will shortly open and develop its big vein coal property in West Virginia, near Elk Garden, on the West Virginia Central & Pittsburg Railroad.

GENERAL MINING NEWS.

ALASKA.

TREADWELL.—Mr. J. Treadwell, manager of this mine, which lies opposite Harrisburg, on the Alaska mainland, has arrived in San Francisco, for the purpose of consulting with the other owners about the introduction of a 120-stamp mill on their joint property. At present, this mine is paying at the rate of $1500 a month; but it is expected that with this improved machinery no less than $60,000 will be its monthly income. The ore is of a low grade, and pays a good milling profit.

ARIZONA.

GRAHAM COUNTY.

ARIZONA COPPER COMPANY.—At an extraordinary meeting of this company, agreements with F. L. Underwood, of Kansas City, were confirmed, and G. A. Jamieson, Sir George Warrender, of Lochend, C. J. Mackenzie, and and J. Wilson were appointed liquidators for winding up the company with the view to it reconstruction.

DETROIT COPPER.—This company, of which Mr. William Church is president, is erecting smelting-works at the mines, to avoid hauling the ore seven miles, as heretofore. The new smelter will be in operation by the beginning of August. A pump and pipe-line has just been completed, by which water is forced from the San Francisco River to the mine, 31,000 feet to the new smelter, and 1500 feet below it. The pump now in operation will supply the town of Morenci as well as the smelting-works.

PINAL COUNTY.

SILVER KING.—The company has made a number of improvements. It has added four large boilers and a large engine, which are used to supply the mine with air. About 125 men are employed.

CALIFORNIA.

INYO COUNTY.

MAXIM.—The mill has begun crushing ore from the company's mine. There is enough ore on the dump for a long run.

MODOCK.—The furnace was to have started on the 9th inst. The strike in the No. 2 tunnel of the Confidence mine shows ore giving 43 per cent of lead.

MONO COUNTY—BODIE DISTRICT.

Reports for the week ended July 6th:

BODIE CONSOLIDATED.—During the past week, there were 327 tons of ore crushed at the mill. The average assay value pulp was $23.48, and of the tailings $2.40.

STANDARD CONSOLIDATED.—Extracted and shipped to the mills 504 tons of ore; received 795 ounces of crude bullion; and shipped to the company this day, $6879.24.

NEVADA COUNTY.

NORTH BLOOMFIELD.—About forty men are engaged in running prospecting-tunnels into the face of the bank, to ascertain whether or not the mine can be profitably worked by the drifting process and cleaning bed-rock. The main prospecting-tunnel is in 100 feet, and is put forward at a good rate.

PLUMAS COUNTY.

FOREST KING.—The ledge is six feet wide, between walls, and has every indication of growing stronger as greater depth is attained. The owners expect to be able to begin crushing by the 15th inst., having rented a mill for the purpose.

WHITING.—A strike is reported in this mine, in French Ravine, near Rich Bar. The ledge is four feet wide, one foot of which, next to the hanging-wall, is rich.

SAN BERNARDINO COUNTY.

BONANZA KING CONSOLIDATED.—Reports dated June 30th state that work has been resumed in the east and west cross cuts on the 7th level and also in the northeast cross-cut on the 6th level. The west cross-cut opposite the shaft is 76 feet in length. The vein in the face of this drift has opened out into a large cave of loose ground intermixed with bunches of high-grade ore. There is a slight improvement in the west cross-cut 6th level north, and it is expected to cut the second chimney of ore in the next few feet. Sinking is going on in a fair showing of ore from the connection in southeast drift 5th level north. The uprise from the 4th level has improved. The formation has a net-work of small seams of rich ore through it, which makes a fair grade of milling material mixed between the walls. On the first, development work will go forward with a full force of miners from San Francisco.

CANADA.

CAPE BRETON, NOVA SCOTIA.

COXHEATH.—It is reported that work has been resumed at these copper mines.

COLORADO.

CHAFFEE COUNTY.

LITTLE HOPE VS. THE COLORADO SMELTING COMPANY.—Mr. A. Eilers has written the following letter to the Leadville *Democrat*, which has been published in the Leadville *Herald:* In your issue of the 2d, I notice an article headed "A Big Suit," which contains such glaring falsehoods that I am compelled to ask you to correct your statements. In the first place, there is no controversy whatever between the Little Hope and the Madonna and Cherubim claims. The latter are two patented claims belonging to this company, and while mining on these claims, we have to our certain knowledge never stoped any ore from ground outside of our side-lines. Our underground surveys are continually kept up, and the nearest that any point of the big stope (which you refer to) is to the Little Hope side-line is 140 feet. This particular body of ore is not even running in the direction of the Little Hope. The worst, however, in the article alluded to, is the statement that "several efforts have been made to compromise the cases, one of which being an offer of $50,000 by the smelter, but it was declined." This is utterly devoid of truth. No offer of any kind has been made, for there is no foundation for any claim against us.

MOUNTAIN CHIEF.—The company has ordered work to stop.

CLEAR CREEK COUNTY.

CORRY CITY.—The shaft has reached a depth of about 240 feet, and the third level will be started at the depth of 230 feet. It is stated that this shaft has been steadily improving with depth. Considerable solid ore is shown in the shaft.

SUMMIT CONSOLIDATED.—During the past month, the mill-runs have averaged about 500 ounces. The uprise has been finished from the 170-foot level to the 110-foot or adit level, which gives the mines good ventilation, the want of which has somewhat retarded the work.

CUSTER COUNTY.

BASSICK.—The grading and masonry for the huge hoisting and pumping machinery is pushed rapidly.

BULL-DOMINGO.—Mr. Stevens has left New York for the mines.

KING OF THE CARBONATES.—Hoisting machinery is erecting, to increase the output of the mine.

DOLORES COUNTY.

LITTLE MAGGIE.—Work has begun again, after having been suspended for many months.

PASADENA.—Work on the grounds of the new smelter at Rico is actively progressing, and it is expected to have the works in operation by August 15th.

GARFIELD COUNTY.

UTE MINING AND SMELTING COMPANY.—The company has been incorporated with a capital stock of $500,000, for the purpose of carrying on operations in this county.

GUNNISON COUNTY.

A correspondent of the Denver *Republican*, writing from Crystal City, states that snow is still encountered between that place and the railroad terminus at Crested Butte, but mining can be pushed from now on, while at no distant day the outlet will be down Rock Creek, where we expect to see a railroad run to our extensive coal-banks. The coal found is unsurpassed for coking purposes, and with capital invested to work the coal, we hope to see a smelter established to treat our ores, there being a sufficient variety to make it a desirable point for a smelter. Fluxes of all kinds can be had. There are some good inducements held out for capitalists to invest in this camp in smelter, concentrator, or in developing mines. A number of the most promising properties are in the hands of parties who have little more than enough to work their annual assessments.

HINSDALE COUNTY.

CROOKES MINING AND SMELTING COMPANY (LIMITED).—The Ulé mine is in a good condition. The Lake City *Mining Register* says that it is now doing what it has never done before—earning money; or in other words, it is not wasting what it earns on experiments.

WISCONSIN & SAN JUAN.—The Littlejohn and four other claims above Capital City are developing.

LAKE COUNTY.

The Leadville *Herald* reports the following:

ADAMS.—The Clontarf & Brookland mines produced during June 1000 tons of ore. This month, the working force has been increased to 45 men, and the product will doubtless exceed 1500 tons, a contract for that amount of ore having been accepted.

AMERICAN SMELTING COMPANY.—The company is receiving a superabundance of lead ore, and is dividing its receipts with the Harrison, Arkansas Valley, and La Plata smelters.

BLUE JAY.—Operations were resumed on this mine after a suspension of work for two months, enforced by surface water.

EVENING AND MORNING STAR.—These companies have renewed their ore contracts with the Omaha & Grant Smelting Company.

FLORENCE.—This mine, on Printer Boy Hill, is shipping regularly about forty tons of ore a day. The product of the mine is sold to the Omaha & Grant Smelting Company, and being a very desirable smelting ore, we are informed it is treated at four dollars a ton. The mineral consists almost entirely of carbonate of lead and oxide of iron. The precious metal contents of the ore, consisting of siver and gold, continue very fair.

FRYER HILL SMELTER.—A third furnace is building, and will be in operation within two or three weeks.

IRON SILVER.—The lessees of the Kaiserine shaft of the Lime lode have struck chloride of silver ores. Some of the workings radiating from the Moyer shaft, it is reported, have struck carbonate ore. Hitherto, the Moyer has show only low-grade sulphide ores.

MINNIE.—This mine, on Iron Hill, which began producing two months ago, and has since yielded about $100,000, is to be supplied with a new hoisting plant and other improvements.

NORTH SIDE.—This claim, situated on the northern slope of Fryer Hill, between the Buckeye and Comique lodes, is yielding between four and five tons of ore a day. The property is a recent addition to the producers of Leadville, having disclosed ore only about a fortnight ago. The mineral consists of iron and galena, carrying considerable quantities of chloride of silver.

ROBERT E. LEE.—The operations of a majority of the lessees on this mine continue very satisfactory. The mine is shipping about forty tons of ore a day, mainly to the Arkansas Valley and Manville smelters. The ore is devoid of lead, but generally runs well in silver.

SILVER CORD.—Four men have been retained to keep the underground workings in repair, and, when not employed in this duty, to prospect the eastern extension of one of the ore-chutes in the mine.

SMALL HOPES.—A new mining plant is erecting on the Forest City claim, at the foot of the Denver City mine waste-dump.

PARK COUNTY.

CHICAGO SAMPLING AND CONCENTRATING COMPANY.—Articles of incorporation have been filed. The capital stock is $10,000. The principal office is located at Chicago, and in Colorado, at London Junction, Park County. B. F. Clark is the duly appointed business agent.

PITKIN COUNTY—ASPEN DISTRICT.

The mines in this district are producing quite handsomely, and promise to do even better in thirty days from now. Over 300 men are employed as miners in the section, ninety of whom are working in the Spar, Vallejo, and Washington mines. The smelter has been blown in, and Hewitt's sampling mill and a concentrating mill are soon to be put in operation, which will further increase the army of industrious workers in the district. New roads are building in the district, and many other permanent improvements are under way and in contemplation. At the Hewitt sampling mill, ore for sampling is already received in large quantities. Mr. R. C. Wilson is negotiating for the old Shepherd smelting plant, with the view of putting in concentrating-works for the treatment of Smuggler ore.

A number of mines have lately resumed work, among which are the One Thousand and One, the Conomara, the Robert Emmet, and the Grand Opening. Discoveries of ore are recorded in the McBride claim, in Spar Gulch, the Emma claim, the Grand View, also in new claims along Hunter's and Woody creeks.

RIO GRANDE COUNTY.

LITTLE ANNIE.—A large amount of pay ore is said to be in sight at this property. The company has 50 stamps running on ore that has milled over $30 a ton.

SAN JUAN COUNTY.

MINERAL KING.—The property has been sold for $60,000.

SAMPSON.—Preparations are making to resume work.

SOLOMON.—A strike is reported in this mine, belonging to the Solomon Silver Mining Company. A cross-cut run to the hanging-wall in the lower tunnel, 150 feet in, cuts a solid body of mineral from 15 to 18 inches wide, consisting of galena, gray copper, and antimonial silver.

DAKOTA.

FATHER DE SMET.—Reports for the week ended July 8th show ore extracted from first, second, and third levels, 1915 tons. Ore milled, 2000 tons. Tramway header advanced 6 feet; header in 57 feet.

GOLDEN SUMMIT.—To better facilitate the work, a new whim has been placed upon the mine. A drift has been run sixty feet from the bottom of the shaft, at a depth of eighty-five feet, in a southwesterly direction, along the course of the vein. It is all in high-grade ore.

RICH.—The 20-stamp mill in Saw-Pitt Gulch known as the Wait & Castner mill, has been purchased and will shortly be moved and erected in this location, in Strawberry Gulch.

MICHIGAN.

COPPER MINES.

HANCOCK.—The building for the new cupola-furnace, at the Hancock smelting-works, is nearly completed, and the stack itself half up. The two new furnaces going up farther down the lake, at the Highland location, have only just been commenced, but it is expected to have them finished the present season.

MASS.—Orders have been received to close down the mine. Nearly all the men have been discharged.

IRON MINES.

Lake shipments of iron ore from the ports of the Marquette District up to and including the 9th of July have been:

	Tons.
Escanaba, Marquette District	249,906
" Menominee "	414,168
Marquette, Marquette "	261,588
L'Anse, " "	25,559
St. Ignace, " "	21,764
Total	972,985

EMMET.—The shaft that this company is putting down on its property adjoining the Ludington, has reached a depth of over 400 feet.

PITTSBURG & LAKE SUPERIOR.—The company has closed down its diamond drill for the season, having disclosed as much ore as it cares to in the present condition of the iron ore business. It is also rumored that the mine will close down until the coming spring. Shipments have ceased for the time being. The company has found a fine body of ore with its drill, and all that is required to make the mine a good one is the sinking of a shaft to the new ore-deposit.

WINDFALL.—The company has a force at work on section 26, 43-32, in the vicinity of Crystal Falls, sinking a series of test pits. The indications are highly encouraging.

MONTANA.

MADISON COUNTY.

BROADWAY.—All the machinery of this gold mining company, consisting of a tramway, hoisting-works, scales, blacksmith and mining tools, and other minor articles, were sold to the highest bidder at sheriff's sale at Silver Star recently. It is stated that the company expended over $500,000 to work refractory ore after an English process, which proved a failure.

SILVER BOW COUNTY.

The Butte *Inter-Mountain* publishes the following statement showing the regular monthly disbursements of the mining, milling, and smelting companies of that camp: Anaconda, $150,000; Lexington, $50,000; Parrott, $40,000; Colorado, $35,000; Alice, $50,000; Silver Bow, Bell, and Dexter, $60,000; Montana, $55,000; miscellaneous, $150,000; total, $600,000. The item "miscellaneous" is payments for labor and supplies for mines owned by individuals, such as the Clear Grit, Liquidator, Poser, Clark's Colusa, Ramsdell's Parrott, and Original.

ALICE.—In the Magna Charta, the expenses of operation are said to be high on account of the separation of the ore-bodies. If the 1st, 2d, and 31 south veins should unite at a greater depth, but little comparative expense would attend the extraction of ore, and the output and profits would be proportionately increased.

BELL.—The smelter is doing full work on its own ore. A contract has been made, and a furnace will be set to work on ore from the Ramsdell's Parrott.

MONTANA.—The company has 1000 tons of crude ore sacked and awaiting shipment at the smelter. There is a lack of car accommodation on both the Utah & Northern and Northern Pacific.

MOUNTAIN VIEW.—Regular shipments of copper ore to Baltimore are now made.

MOULTON.—The transfer from the Moulton Mill and Mining Company of Utah to the Moulton Mill and Mining Company of Montana of all the properties, including the mine and forty-stamp mill, of the company, took place at Butte, July 3d. The new company was organized under the laws of Montana on the first inst., the directors named in the articles of incorporation to serve during the first three months being W. A. Clark, J. M Moore, J. R. Clark, E. H. Murray, E. C. Ford, H. A. D'Acheul, J. K. Clark, C. Borie, and Alexander J. Johnston. At a meeting of the directors, the following officers were elected: W. A. Clark, President; Eli H. Murray, Vice-President; J. R. Clark, Treasurer; A J. Johnston, Secretary; J. M. Moore, Assistant-Secretary. The transaction was brought about mainly by the large holding of Moulton shares by Montana capitalists. The shares of the new company have a par value of $5, instead of $25, as issued by the old company, and the entire capital stock is reduced from ten million dollars in the old company to two millions in the new.

SANTA FÉ COUNTY.

At Golden, a Cincinnati company is erecting a 40-stamp mill to work the free ore that abounds in the camp.

The Davenport amalgamator company's works have been running successfully for some time past, and an arrangement has been made with them by the Cincinnati company to get the waste water for the use of the stamp-mill.

The representative of a Chicago company that owns a considerable tract of placer ground is at this place, and is receiving large quantities of machinery, which will be put in position at once for placer work. This company expects to be ready to begin operations some time during the present season.

NEVADA.

EUREKA COUNTY.

ALBION VS. RICHMOND.—Reports from Eureka, dated July 8th, state that after two days' argument before Judge Rives, of the District Court, he virtually denied the motion to continue the suit of the Albion *vs.* Richmond for a half-million dollars' damages, conditional upon stipulations to be made by a meeting of the court. Great interest is manifested, as, on account of the suit, the Richmond has closed down the mine furnaces and refinery, thereby throwing out of employment a large number of laborers. The motion for continuance was made on the ground that the same issues were pending in the United States Supreme Court.

RICHMOND CONSOLIDATED.—The report of the directors, prepared for presentation at the meeting in London, submits the statement of accounts and balance-sheet for the year ended February 29th, showing that the net profit for the year is £30,146 8s. 4d. Out of this sum of £30,146 8s. 4d., and the sum of £14,478 6s. 9d. brought forward from last year's account, the directors have paid in dividends during the year £27,000, or 10 per cent per annum, leaving a balance on February 29th to the credit of revenue of £17,093 13s. 5d., which is carried forward to next year. During the year, 8960 tons of Richmond ore, and 5955 tons of purchased ore have been smelted by the general furnace, and 889 tons of low-grade Richmond and 3807 tons of purchased ore have been smelted by the No. 4 furnace working in connection with the refinery. The total production for the year from both furnaces is 14,750 ounces of gold, 479,064 ounces of silver, and 3256 tons of lead. The amount received during the year on sales of gold, silver, and lead is £170,600 5s., and the estimated net value of the bullion in transit and at the works unrealized on February 29th, after allowing for all unpaid refining and marketing expenses, is £135,249 11s. 5d.; together, £305,849 16s. 5d., from which, deducting the value of the bullion in hand February 28th, 1883, and £22,696 17s. 1d. paid for marketing expenses, refining, freights, commission, brokerage, etc., leaves £183,877 19s. 7d. as the net value of the bullion produced in the year. The cost of mining, dead-work, smelting, purchased ore, renewals and repairs, and all other working and general expenses at Eureka being £144,698 19s. 11d., the profit for the year on mining, smelting, and refining is, with £62 12s. received for sundries, £49,241 11s. 8d. The ore smelted this year has been of better quality, the average assay being $56.91, as against $49.93 last year, and the yield per ton of ore has been this year $52.73, as against $44.19. The expenses of mining have increased from $13.01 to $15.83 per ton of ore; this is on account of the much smaller quantity extracted—9849 tons, as compared with 25,474 tons, and the greater amount of labor required to extract it. The smelting expenses per ton are about the same as last year, $11.72, as against $11.66. The amount paid for purchased ore has been very large, £48,357 for 9762 tons, as against £24,465 for 3559 tons last year. Two furnaces have been running regularly throughout the year, the general furnace smelting ore, and the refinery furnace accretions from the slag-dump, drosses, and low-grade ore. During the year, £4506 7s. 8d. have been expended out of revenue in repairs and renewals of plant and machinery, and the works have been kept in efficient order. Smelting and refining have now been carried on continuously since July, 1881, the largest run in the history of the company. The past winter has been the most severe and longest ever known at Eureka, the country being covered for a long time with deep snow, and great difficulty has been experienced in getting sufficient supplies of ore and fuel to keep the furnaces at work. The exploratory work done in the mine during the year consists of 3415 feet of drifts, 59 feet of winzes, and 159 feet of rises, making a total of 3633 feet. The cost of this dead-work (£5492 0s. 9d.) has been included in the working expenses of mining. The directors regret that these explorations have not been attended with any great success. A small body of good ore was developed on the 300 level in July last, and small bodies of ore and ledge matter have been found on other levels, but no large bodies have been met with. Nothing further has been done in the levels below the 1050. Explorations have been carried on in the Williamsburg mine, £2266 7s. 10d. having been expended in erecting hoisting-works and running drifts, etc., and 526 tons of ore from this mine, worth £1201 5s. 7d., have been smelted during the year. In the accounts, the purchase-money and outlay on this mine have not been charged against capital, but are treated as an asset. Some further work has been done on the Hoosac mine, but only a few tons of ore have been extracted. The price of lead throughout the year has been exceptionally low, and, as the shareholders were informed by circular of November 6th, 1883, no sales have been made. The company has now 8449 tons of the old stock in hand. The difference between the price at the end of the financial year (4 cents a pound) and that at which it was estimated in last year's accounts (4½ cents) amounts to £2 a ton, or £16,898. This depreciation in value the directors have, pending the realization of the lead, written off the reserve fund; they, however, are led to believe that it will ultimately realize the original estimate of 4½ cents, or more, when the reserve can be restored to £75,000. The production since February, 1883, is valued in the accounts at the lower price of 4 cents a pound. The best large sale made by the company was at the rate of 4 85 cents a pound. In consequence of the company having such a large stock of lead, the directors have been obliged to defer the payment of further dividends until it, or the greater part of it, is sold; and while sympathizing with the shareholders in the disappointment this has caused, they have reasonable hopes that the policy they have been obliged to adopt will ultimately be found beneficial for their interests. With reference to the Albion suit, the appeal against which is still pending in the Supreme Court at Washington, the Albion Company, without waiting for the result of the appeal, has made an application to the District Court at Eureka to have the damages claimed by it assessed, and it is expected that this matter will come before the court in July.

STOREY COUNTY.

DELAWARE.—The hoisting-works of this company, on American Flat, were recently destroyed by fire. The mine has not been worked for three or four months past, but it was the intention of the management to resume work in about two months. The machinery is almost totally destroyed. The fire is supposed to be the work of an incendiary.

COMSTOCK LODE.

Work is to be started in the upper levels of the Best & Belcher and Gould & Curry. At the Potosi, the work of drifting was resumed in the main lateral drift on the 2800 level. The Cornish pumps at the 2900 level have been connected with the hydraulic system of the levels above, and all the pumping apparatus is working very satisfactorily. Operations will soon be resumed on the 2800 level of the Hale & Norcross. No full returns have yet been received from the Mexican mill on the crushing of ore from the 200 level. Over 1000 tons of ore have been sent to the Eureka mill, and the shipments continue to be 50 or 60 tons a day. The Gold Hill mines are extracting ore from the stopes and old upper levels of the Crown Point, Belcher, Kentuck, and Yellow Jacket mines.

UTAH.—The report presented at the annual meeting held in San Francisco recently, shows that the repairs to drifts and pipes that connect with the Sutro tunnel were completed early in August, 1883, since which time almost the whole year has been spent in running drifts in ground that has never been prospected before. In the 1350 level, no ore of value was found. In the 1750 level, the north lateral drift has been extended from the incline station 87 feet. This drift has been of considerable promise. Thirty feet from the face, a clay wall of four feet in thickness was cut, exposing vein material that gave low assays—that is, from $3 to $5 per ton. At the face of this drift, the flow of water gradually increasing, work was stopped. The north lateral drift of the 1950 level has been extended 112 feet. No values by assays were obtained. The financial statement showed $207.32 cash on hand.

NEW MEXICO.

BERNALILLO COUNTY.

There is a fair probability that the Albuquerque smelter will soon be in practical hands, and ready for operation. Two or three parties have recently examined the premises with the view of buying or leasing, and it is probable that satisfactory terms will be arranged with some of them.

GRANT COUNTY.

The shipments of ore from this county average over $175,000 a month.

PIÑOS ALTOS.—The company's mill has started up. There is a large amount of ore on the dump, which averages $17 per ton. The company also has from 4000 to 6000 tons of mill tails on hand that are estimated to contain $80,000. They are run through the stamps and over the vanners at the rate of about five tons of tails to ten tons of ore.

SIERRA COUNTY.

The reports of the stockholders' meeting of the Sierra Grande, Sierra Bella, and Sierra Apache companies, held at Lake Valley, New Mexico, July 1st, show that the proposition to reduce the par value of the stock of each company to $5 per share was carried by the following vote: Grande, 286,301 shares; Bella, 155,263 shares; Apache, 154,699 shares; which is more than the required two thirds. There are yet some legal formalities to be gone through before the question is finally settled. The annual report for the stockholders will be ready about the end of September.

UTAH.

The Salt Lake *Tribune* states that advices from all the mining centers are to the effect that great activity prevails everywhere, with unusually good prospects for a prosperous season.

JUAB COUNTY—TINTIC DISTRICT.

The iron ore trade is keeping up a steady movement, furnishing fluxing material for the several furnaces of Salt Lake County. During the last month, there were sent up 2700 tons, or a hundred tons for every day the railroad was running.

CARISSA.—The owner is sinking a new shaft and conducting other work on the copper portion of that vein.

EUREKA.—The daily production amounts to 100 tons.

NORTHERN SPY.—A strike has been made. Preparations have been making for starting a mill in connection with this property, at Homansville.

VIRGINIA.

The tin veins of Rockbridge and Amherst counties are still explored, and the prospecting operations reveal good showings of cassiterite. It is probable that some English people, owners of tin mines in Cornwall, England, will, before long, visit the tin mines, with the view of becoming interested in their development.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, July 18.

Business was quite active in the mining market this week, and the dealings were more generally scattered throughout the list. The Comstocks were the chief objects of interest, and were quite strong in the early part of the week, but suffered a decline toward the close. There was nothing special from the mines to occasion the increase in prices, but they rallied in sympathy with the San Francisco market, which was quite strong Monday and Tuesday. The Bodie stocks were on the decline and closed weak, with the exception of Consolidated Pacific. The Leadville and Tuscarora stocks were very quiet and ruled at steady prices. The remainder of the market was of but little interest. We give a complete summary below. The total number of shares sold was 116,970, as against 101,961 last week.

The Comstock shares were moderately active, and sold at irregular prices. California records a fair business at weak prices, selling at from 46@30c. Consolidated Virginia was very actively dealt in and was very irregular; it sold at from 33@51@35c. Sierra Nevada was also irregular, selling at from $1.60@$2.30@$2, with a fair business. Union Consolidated declined from $2.50@$2@$2.05 under a small business. Mexican was strong, selling at from $1.75@$2.10. Ophir records a small business at strong prices, selling at from $2@$2.30. Hale & Norcross sold at $5.50, seller 10 days. Sutro Tunnel was very active at irregular prices; it sold at from 14@19@16c.

The Leadville stocks were almost neglected. Breece was quiet and steady at 16@17c. Iron Silver sold at from $1@98c. with a small business. Little Chief was but moderately dealt in at steady prices; it sold at from 31@30c.

The Bodie stocks were moderately dealt in and seemed inclined to weakness. Bodie Consolidated declined from $2.40@$1.65@$2.25. Standard was quiet and steady, selling at $1. Bulwer was quite weak, declining from 53@39c., with an active business. Consolidated Pacific was active, and sold at irregular prices; it was quoted at from 48@44@46c.

The Tuscarora stocks were quiet and steady. Argenta sold at 15c. Belle Isle was quiet and sold at from 45@60c. on time sales. Navajo was strong, selling at from $3.95@$4.10, with a small business. North Belle Isle sold at 25c., and Independence at 20c.

In the miscellaneous list, Eureka Consolidated was strong, selling at from $2@$2.50, with a small business. Green Mountain sold at $2, and was but moderately dealt in. Horn-Silver was quiet and steady, selling at from $5.50@$5.63. Robinson sold to-day at from 21@22c. with small transactions. Stormont sold at 13c.

Barcelona was very quiet at 14c. Caledonia records a fair business at weakening prices; it sold at from 85@75c. Harlem sold at from 6@3@4c. under a small business. Lacrosse was quoted at 7c. Sonora sold at 3c., and was but moderately dealt in.

DIVIDENDS.

Calumet & Hecla Copper Company, of Michigan, has declared a dividend of $3 a share, payable August 15th.

Father de Smet Consolidated Gold Mining Company, of Dakota, has declared a dividend, No. 35, of twenty 20 cents a share, payable July 31st at the office of Laidlaw & Co., No 14 Wall street.

Homestake Gold Mining Company, of Dakota, has declared its seventy-first dividend for June of $25,000, payable at the office in San Francisco, or at Messrs. Lounsbery & Haggin's, this city, on the 25th inst. Total of dividends to date, $2,462,500.

Kentuck Mining Company, of Nevada, has decared a dividend of ten cents a share.

Rooks Gold Mining Company, of Vermont, has declared dividend No. 2 of $10,000, or twenty cents a share, payable July 25th, at the office of the company, Room 8, Tremont Temple, Boston, Mass.

PIPE LINE CERTIFICATES.

Messrs. Watson & Gibson, Petroleum Brokers, No. 49 Broadway, report as follows for the week:

The oil market opened last Saturday at 61¼c., closing one point lower. Monday, it sold off to 59½c., closing 60¼c. On Tuesday morning, news was received that the Hoffman well at Wardwell Ferry was smaller than expected, and that the other wells in that district were declining in production. This started some covering by the "bears," and prices got up to 62@63c., when the failure of C. S. Henry, a large bear operator, was announced. He was reported to be short about 700,000 barrels, and the buying in of this forced up the price to 65¾c. The market on Wednesday sold down to 62⅜c., but rallied to 64⅜c. at the close. The market Thursday was very strong, and oil closed 64⅞c., having sold up to 65⅝c. To-day, the price was steady through the day at about 64½c., but broke toward the close to 63⅜c., final sales being at 63¾c. The Producers' Union, which was to shut down production, has been abandoned as the developments in Wardwell Ferry have been so large that they can not hold the combination together. Wall street rumors do not appear to influence the market as much as heretofore. The bears say that production will run so far ahead of consumption as to keep prices down for some time. The bulls say that the present prices discount all the adverse news, and more.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 12	$0.61¼	$0.61¼	$0.60	$0.60¼	5,501,000
14	.60	.60⅜	.59½	.60⅛	5,526.000
15	.60¼	.65¾	.60¼	.62¾	11.167.000
16	.62¾	.64½	.62⅜	.64⅜	4,290,000
17	.65	.65⅝	.64½	.64⅞	6,516,000
18	.65	.65	.63⅜	.63¾	5,482,000
Total sales					38,482,000

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. July 11.	July 12.	July 14.	July 15.	July 16.	July 17.
Albion	...	...	...	...	...	...
Alpha	...	...	...	...	...	...
Alta	2⅛	...	3¼	2½	2¾	2⅞
Argenta	...	...	...	...	...	...
Bechtel	...	...	...	...	...	...
Belcher	1	...	1¼	1¼	1⅛	1⅛
Belle Isle	...	...	...	...	...	...
Best & Belcher	2⅞	...	3½	2⅜	2⅜	2½
Bodie	2	...	2	1⅞	1⅞	1¾
Bullion	...	...	...	...	...	...
Bulwer	...	...	...	...	...	...
California	.30	...	.45	.20	.30	.30
Challar	3⅞	...	4¾	3¼	4	4
Con. Pacific	.40	...	.45	...	.45	.45
Con. Virginia	.30	...	.50	.30	.35	.35
Crown Point	1⅝	...	1½	1⅜	1⅜	1⅜
Day	...	...	...	...	...	...
Elko Cons	...	...	...	...	...	...
Eureka Cons	...	...	...	2¼	2½	2½
Exchequer	...	...	...	...	...	...
Gould & Curry	1¾	...	2½	1⅝	1¾	2
Grand Prize	...	...	...	...	...	...
Hale & Norcross	4⅞	...	6¼	4⅞	5	4⅞
Independence	...	...	...	...	...	...
Martin White	...	...	...	...	...	.25
Mexican	1⅝	...	2⅝	1¾	2	2¼
Mono	...	...	...	...	...	...
Mount Diablo	...	...	2	2	...	2
Navajo	4½	...	3¾	4	4	4
Northern Belle	...	...	...	...	...	...
North Belle Isle	...	...	...	...	...	...
Ophir	1¾	...	2⅛	1½	1½	1¾
Overman	...	...	...	...	...	...
Potosi	1⅞	...	2¼	1½	2⅛	2
Savage	1¼	...	1¾	1¼	1½	1½
Scorpion	...	...	...	...	...	...
Sierra Nevada	1⅞	...	2½	1¾	1⅝	1¾
Silver King	...	...	...	...	...	...
Tip Top	...	...	...	...	...	...
Union Cons	1⅞	...	2½	1¾	1¾	1¾
Utah	1½	...	1¾	.90	1	1¼
Wales Cons	...	...	...	...	...	...
Yellow Jacket	2⅜	...	2¾	2⅜	2¼	2

The following are the financial balances of the various mining companies on July 1st:

CASH ON HAND.

Alta	$25.342.29	§Hale & Norcross	$54.991.79
Alpha Con	2,786.83	Martin White	3,225.20
Argenta	1,042.12	Mono	5,287.54
Andes	7,521.97	‖Mexican	75.56
Bodie Con	175,499.31	Occidental	3.805.54
*Belcher	17,143.42	Ophir	63,702.87
Best & Belcher	15.863.88	Potosi	166.63
Bulwer	2,366.08	Sierra Nevada	69.441.93
Benton Con	7,762.39	Savage	33,021.85
†Con. Virginia	52,805.28	Summit	316.11
Chollar	26,633.31	Tioga Con.	1,088.59
‡Day	520.87	Union Con	9,436.53
Exchequer	12,783.25	Utah	5,849.40
Gould & Curry	6,614.22		

INDEBTEDNESS.

California	$7,810.56
Grand Prize	36,477.53
Lady Washington Con.	3,063.76
Standard	30,023.33

Albion indebtedness, exact amount not known; approximate, $260,000.

* Due Sutro Tunnel Company, $10,920.

† Monthly expenses at mine partly paid; exact amount unknown.

‡ Bills payable, $76,567.57; outstanding drafts, $48,311.86.

§ Due on assessment No. 82, $6864.

‖ Overdraft at Nevada Bank, $7214.71.

Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, July 17.

The market for copper stocks continues to rule very dull and prices irregular. The dealings in Calumet & Hecla comprise the principal part of the business done, and transactions in other stocks are very limited. Calumet opened at $145, and gradually settled on small sales to $141, the lowest price touched since the passing of the May dividend; but on the announcement of a dividend of $3 a share, payable next month, it rallied again to the opening price, which, however, was not sustained; the stock selling off again to-day to $143½, closing at $143½ bid, $144 asked. At the present market price, and with a quarterly dividend of $3 a share assured, it would appear as if the stock was a fair purchase as an investment. Quincy, steady with sales at $36. Osceola advanced from $11@$12. Franklin, $6¾ bid, and none offered. Atlantic, $7¼ bid, $8 asked. Huron, $1⅛ bid. Pewabic, $1¼ bid. In the last-named stocks, there is nothing doing, and the prospect for any activity outside of the two or three dividend-paying stocks is not encouraging.

In silver stocks, there is still less activity—in fact, there is no market. A sale of 1000 shares Catalpa at 25c. is the only recorded transaction for the week at the regular Board, while, at the Mining Exchange, the daily sheets show that the business, if legitimate, would not pay the expenses of any one member of the Board. About the only stock which the Board had to trade in was Bowman Silver, and that has been killed by its friends. A few weeks ago, it was manipulated up to 20@21c. on reported good strikes in the mine, evidently for the purpose of preparing the way for another assessment, which came yesterday, and was announced at the Board at 5 cents a share. The stock declined to 6c., and there is not much wanted even at that. Dunkin is in fair demand at 16c. bid, 20c. asked. Catalpa, 25c. Empire, 12c. bid, 16c. asked.

3 P.M.—There was no change in the market this afternoon. Calumet & Hecla sold at $143½. Quincy, $36 bid. Osceola, $11 bid, $12 asked. Others unchanged.

BULLION MARKET.

NEW YORK, Friday Evening, July 18.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
July 12	50¾	110¼	July 16	50 13-16	110⅝
14	50 13-16	110⅝	17	50 13-16	110½
15	50 13-16	110⅝	18	50 13-16	110½

BULLION PRODUCTION FOR 1884.

MINES.	States.	Month of June.	Year from Jan. 1st, 1884.
		$	$
*Alice, G. S.	Mont.	†	520,843
*Belmont	Mont.	———	8,081
Bodie, G.	Cal.	61,755	363,612
*Bonanza King, S.	Cal.	.....	191,891
*Boston & Montana, G.	Mont.	.....	207,474
*Chrysolite, S. L.	Colo.	14,572	85,365
*Consolidated Bobtail, G.	Colo.	.....	39,654
*Contention, S. G.	Ariz.	———	293,607
*Deadwood-Terra, G.	Dak.	50,949	260,923
*Derbec Blue Gravel, G. S.	Colo.	.....	58,644
*Father de Smet, G.	Dak.	40,733	223,938
Grand Prize, S.	Nev.	.....	25,000
*Hecla Cons., G. S. L. C.	Mont.	‡	320,052
Helena, S. L.	Mont.	.....	164.000
*Homestake, G.	Dak.	98,631	607,988
*Hope, S.	Mont.	.....	17,980
Horn-Silver, S. L.	Utah.	225,000	1,194,087
Iron Silver, S. L.	Colo.	.....	515.650
*Kentuck, G. S.	Nev.	2,013	18,860
*Lexington, G. S.	Mont.	98,594	612,686
*Little Pittsburg, S.	Colo.	6,983	52,949
*Moulton, G. S.	Mont.	53.007	370,906
*Mount Diablo, S.	Nev.	———	24,820
*Navajo, G. S.	Nev.	16,374	172,530
*Ontario, S. L.	Utah.	203,443	1,021,841
*Original, S. C.	Mont.	.....	29,724
*Oxford, G.	N. S.	2,375	19,907
*Paradise Valley, S. G.	Nev.	.....	45,164
*Plymouth Consolidated, G.	Cal.	76,830	532,356
*Rooks, G.	Vt.	.....	16,068
*South Yuba, G.	Cal.	.....	15,615
*Syndicate, G. S.	Cal.	14.714	76,408
*Tombstone, S. L.	Ariz.	———	392,692
United Gregory, G.	Colo.	.....	7,174
Total amount of shipments to date			$8,153,807

* Official. † Assay value. ‡ Not including value of lead and copper. ** Silver valued at $1.05 an ounce. G. Gold; S. Silver; L. Lead; C. Copper. ——— No bullion produced.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 2 per cent. During the week, the bank lost £126,483 bullion, but the proportion of its reserve to its liabilities was raised from 43 to 44⅝, against 41 7-16 per cent at this date last year. The weekly statement of the Bank of France shows a loss of 2,075,000 francs gold and a gain of 33,000 francs silver.

METALS.

NEW YORK, Friday Evening, July 18.

Copper.—During this week, there has been a sale of Lake copper at 13⅛c., probably due to the fact that some small mines have been forced to market by urgent needs for money. The condition of some of the smaller Lake companies will probably lead to a more frequent occurrence of such exceptional transactions. We quote other brands as heretofore, 13@13⅛c. London cables £53 17s. 6d. for Chili Bars and £60 for Best Selected.

The following statistics of copper in England and France for the month of June have been published :

	Imports.	Deliveries.	
	—June 1 to 30.—		
	Tons.	Tons.	
Fine foreign, chiefly Australian	994	676	London.
Chili — Bars	1,713	1,868	
Chili — Ingots	376	182	
Chili — In ores and regulus	7	7	Liverpool and Swansea.
American, chiefly furnace material	1,720	1,668	
Spanish precipitate and sundries	1,825	984	
Totals—England	6,635	5,385	
American, chiefly ingots	420	310	
Chili bars, ingots, and Barilla	1,959	1,784	France.
Sundries	135	145	
Totals — England and France	9,149	7,624	
	—Stocks.—		
	June 30.		
	Tons.		
Fine foreign, chiefly Australian	3,954		London.
Chili — Bars	23,061		
Chili — Ingots	196		Liverpool and Swansea.
Chili — In ores and regulus	1,074		
American, chiefly furnace material	138		
Spanish precipitate and sundries	4,771		
Totals—England	33,194		
American, chiefly ingots	160		
Chili bars, ingots, and Barilla	1,235		France.
Sundries	10		
Totals—England and France	34,599		

Advised by mail and telegram :

	Tons.
Chili	9,190
Australian	1,550
Total visible supply	45,339

	Jan. 1 to June 30.		
	Tons.	Tons.	Tons.
England and France :	1884.	1883.	1882.
Imports	46,855	41,964	30,968
Deliveries	52,099	40,937	38,385

Tin.—Business has been confined to jobbing lots, the market being firm at 18⅜@18·95c. for spot Straits tin. London cables to-day, £82 12s. 7d.

Lead.—The market has been extremely quiet, sales being confined to small lots at 3·55@3·60c., which we quote. The future of the metal is looked upon without any anxiety to many. As the Richmond report, printed elsewhere, shows, the stock of that company is somewhat less than generally estimated, being only a little more than 8000 tons. London cables £10 5s.

Western white lead manufacturers have reduced the price of White Lead from 6¼@5¾c.

From St. Louis, Messrs. John Wahl & Co. telegraph to us as follows to-day :

Our market is unchanged. Sales for the week sum up 300 tons of Refined lead at 3·37½c., St. Louis, and 100 tons of Chemical lead at 3·40c., delivered at East St. Louis.

Messrs. Everett & Post, of Chicago, send us the following dispatch :

Our market is quiet and dull, prices being unchanged, there being no buyers to speak of. The price is nominally 3⅜@3·40c. There is comparatively little offering here, but more than enough to supply prompt consumptive demands.

Spelter.—There have been some forced sales under 4·50c., which, however, are no criterion of the true state of the market, which we still quote at 4·50@4·60c. for Common Domestic. The trade is very dull. England cables £14 7s. 6d. for Silesian.

Antimony.—There has been no notable change.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 18.

In our issue of July 5th, our statement that the Baldwins purchased a lot of Chickies pig-iron at $20, might lead to the inference that it was sold at that figure delivered in Philadelphia, when the fact is, that the Chickies Iron Company has not sold any lot at less than $20 at furnace.

American Pig.—The leading characteristics of the iron market remain the same ; firmness in No. 1 Foundry, greater ease in No. 2 and Gray Forge, and a general timidity of buyers.

We quote standard brands : No. 1 Foundry, $20@$20.50 ; No. 2, $18.50@$19 ; and Gray Forge, $17.50@$18.50, with outside brands from 50c.@$1 lower. Foreign Bessemer is nominally $19@$19.50. Spiegeleisen is nominally $28 for 20 per cent.

Scotch Pig.—The market continues dull and weak.

We quote ex ship and to arrive : Coltness, $21.50 ; Langloan, $21.50 ; Summerlee, $20.75; Dalmellington, $20 ; Gartsherrie, $21 ; Eglinton, $19.25@$19.50 ; and Glengarnock, $20@$20.50.

At the Metal Exchange, the following cable quotations have been received : Coltness, 57s. ; Langloan, 53s. 6d. ; Summerlee, 50s. 6d. ; Gartsherrie, 51s. 6d. ; Glengarnock, at Ardrossan, 49s. 6d. ; Dalmellington, 47s. ; and Eglinton, 43s. 6d. Warrants, 41s. 3d.

Steel Rails.—The principal event during the week has been the sale by the Edgar Thomson Works of 12,000 tons of rails delivered at Chicago for $30.50, equivalent to $28 at mill. The special circumstances of this transaction make it unfair to consider it as more than indicative of the state of the market. As we understand it, other customers of the works have postponed delivery of orders, and the order was taken to keep the works running. Besides, a special consideration was, that the rails are paid for in cash. We may state that the Bethlehem Company is reported to have closed down and that the Troy works will stop making rails on August 1st. For small lots, standard weights, ordinary conditions, we quote $30 at mill.

Old Material.—The market is quiet. We quote $18@$18.50.

Philadelphia. July 18.

[From our Special Correspondent.]

Pig-Iron.—It is early in July to report any improvement in pig-iron; but, according to the statements of reliable brokers and manufacturers, there is a better feeling in the market, both for crude and finished iron. But the probabilities are, that it will not be of very long duration, especially if a few more furnaces should blow in. There are several companies desirous of blowing in, and they will do so if they see the slightest chance of unloading stocks, even at a very narrow margin of profit. There is no change whatever in quotations, either for ordinary or special brands. Your correspondent omitted a word or two in the last report, which might create a wrong impression as to Chickies iron, which was quoted at $20, to which should have been added the words "at furnace." This brand, with four or five others, is well sold up and will probably be in good demand throughout the season. The only weakness reported is in inferior irons, which are in abundant supply. Weak as they are, there is very little room for any further decline. Comparatively little No. 1 Foundry has sold over $20 ; $20.50 buys a very good iron; some of inferior make has sold as low as $19 ; Gray Forge averages $17.50. Sales are in from 25 to 100-ton lots. Three or four furnace companies report themselves well sold up since the first of the month, and others expect to have some good contracts closed before the first of September; but, of course, this depends on the course of the finished-iron trade.

Foreign Iron.—Nothing whatever can be said as to foreign irons, except to repeat quotations at $19@$19.50 for Bessemer, and $28 for 20 per cent Spiegeleisen.

Blooms.—Charcoal Blooms are quoted at $54, and Anthracite at $43. Sales are small.

Merchant Iron.—An improving demand has set in, but only, as yet, for small lots. There are rumors to the effect that demand will soon be active, and it is probable that these will prove correct. Consumers have very little on hand. Some parties are selling iron at one tenth more than was obtained two weeks ago. Others are taking old prices. There is a disposition to hold prices a little firmer, owing to the near approach to the opening of the fall trade. Consumers everywhere are light in stocks. Refined Iron ranges from 1·85@1·95c., and Common from 1·65@1·80c. There are several requirements for common iron that will probably be delivered within a week or ten days.

Plate and Tank-Iron.—Last week, two or three plate manufacturers reported themselves sold up, and this week two or three more have put themselves on the list of the satisfied. This is gratifying and has had the effect of inducing some two or three manufacturers who are still in need of business to hold a little more firmly to decent prices. Plate-iron can be had at 2c. Shell-iron sold last week at 1·50c., in 15-ton lots, those who bid 1·60c. losing the business. The nominal quotation is 2·75c. Flange is quoted at 3·75c., with a like shading to be had on large lots. Very little fire-box has been bought.

Nails.—The demand continues light, and stocks are threatening to accumulate to dangerous limits. Most of the building requirements have been provided for. Prices range from $2.40@$2.50 for small lots, with discounts of from 5@10 cents on large lots.

Structural Iron.—There has been a good deal of inquiry, and considerable business transacted in small lots, amounting to about 900 tons. There is an order for 600 tons for a Down-East party, that will probably be placed either Saturday or Monday. The structural iron people are in good spirits and expect to have enough business to keep them running steadily for some time to come. Angles sell at 2c. at mill, up to 2·20c., according to size of order, Tees are nominally 2·75c., and Beams and Channels are shaded at 3 50c.

Steel Rails.—There are rumors of steel rails from Pittsburg being delivered at Chicago at $31. The freight from Pittsburg there is $2, and from here, $2.50. If these rumors are correct, there is a still further declining tendency in rail prices ; but the nominal quotations are $30@$31.50, according to size of order and date of delivery, with light sections ranging from $34@$38, according to weight. Only small lots are ordered.

Old Material.—Old American rails are offered as low as $18, but it is impossible to get hold of actual transactions, although some have taken place for parties in the interior. Foreign rails are nominally $18.50@$19.50 ; no transactions reported. Crop-Ends are nominally $20@$21. Bridge Rails and Double-Heads are nominally $23. Sales of No. 1 Wrought have been made at $21.

Pittsburg. July 17.

[From our Special Correspondent.]

Pig-Iron.—Business continues dull—duller then it should be, and duller than it will be within a month, while there are a number of sales reported. They are all small, which shows that buyers are still adhering to their old policy of buying only for present wants. The sales this week were slightly heavier than last, as a little more work is done in the mills ; but what the commission men and furnace men are looking for is that time when mill-owners will buy enough to keep some stock ahead. Prices, as compared with those of last week, remained unchanged. Ordinary grades of Forge Iron may be fairly quoted at $16 cash, to $17, 4 months ; some special brands command a shade more ; all ore do., $18@$19, 4 months; and Bessemer, $19.50@$20.50, 4 months. Foundry Iron sold all the way from $17@$19 cash, according to quality. The report of sales shows about 1100 tons, but I heard of sales not included in the report.

Manufactured Iron.—There is a very slight improvement. Structural iron trade is somewhat better. There is increased inquiry, and the indications are for a good fall trade. Jobbers and consumers are still adhering closely to the hand-to-mouth policy, and, as they have no stock, must buy right along up to the demand. Prices are as heretofore quoted.

Muck-Bar.—This line continues very dull, and there are no sales, and consequently no prices different from the last quotations.

Nails.—10d. to 60d., $2.20@$2.25, 60 days, or 2 per for cash, with 10 cents abatement on carload lots. There is still cutting on prices, and the demand is light. Improvement and more firmness are expected shortly.

Steel.—The merchant steel trade continues sluggish and unsatisfactory, particularly as regards lower grades, in which competition is sharp and prices cut a good deal.

Wrought-Iron Pipe.—Business in other lines than

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. July 12. H.	July 12. L.	July 14. H.	July 14. L.	July 15. H.	July 15. L.	July 16. H.	July 16. L.	July 17. H.	July 17. L.	July 18. H.	July 18. L.	SALES.
Alice, Mon.													
Anie Con. Co.													
Argenta			.15										100
Bassick, Co.													
Belle Isle, Ne.			.45								.60		300
Bodie Cons., Ca.			2.40	2.35			1.65				2.25	2.00	875
Breece, Co.	.17	.16						.17					3,000
Bulwer, Ca.	.73	.50	.50	.45	.45		.50	.40			.43	.39	4,620
California, Ne.			.43	.40	.46	.42	.35	.30	.32	.30	.31	.30	4,500
Cal. & Hecla, Mich.													
Castle Creek													
Chollar													
Chrysolite, Co.													
Cons. Va., Ne.	.35	.33		.38	.51	.46	.40	.25	.41	.38	.40	.35	27,000
Deadwood-Terra, Dk.													
Dunkin, Co.													
Eureka Cons., Ne.			2.30						2.25		2.50	2.25	425
Father de Smet, Dk.											4.45		100
Findley, Ga.													
Gold Stripe, Ca.													
Gould & Curry, Ne.													
Grand Prize, Ne.													
Green Mountain, Ca.					2.00						2.00		1,700
Hale & Norcross, Ne.											5.50		100
Hall-Anderson, N. S.													
Homestake, Dk.	9.50												100
Horn-Silver, Ut.	5.63										5.63	5.50	1,253
Independence, Ne.							.33						200
Iron Silver, Co.							.98		1.00		1.00	.98	1,100
Leadville C., Co.													
Little Chief, Co.	.31	.30											1,400
Little Pittsburg, Co.													
Martin White, Ne.			.10										100
Navajo, Ne.					4.00	3.95					4.10		1,000
Northern Belle													
North Belle Isle, Ne.			.25										100
Ontario, Ut.					18.50								10
Ophir, Ne.			2.00		2.30								360
Quicksilver Pref., Ca.													
" Com., Ca.													
Robinson Cons., Co.											.22	.21	250
Savage, Ne.													
Sierra Nevada, Ne.	1.95	1.60	2.00		2.30		2.00		2.00		2.00		1,050
Silver King, Ar.													
Spring Valley, Ca.													
Standard, Ca.					1.00		1.00				1.00		284
Stormont, Ut.	.13												1,000
Tip Top, Ar.													
Vizina, Ar.													
Yellow Jacket													

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. July 12. H.	July 12. L.	July 14. H.	July 14. L.	July 15. H.	July 15. L.	July 16. H.	July 16. L.	July 17. H.	July 17. L.	July 18. H.	July 18. L.	SALES.
Albion			.16										100
American Flag													
Barcelona, G.	.14												500
Bechtel Con., G.													
Belvidere													
Best & B'icher, G. S.													
Big Pittsburg, S. L.													
Bradshaw, S.													
Bull-Domingo, S. L.													
Cal., B. H., G.			.84	.80	.85		.75				.75		1,100
Central Ariz'na, S.													
Climax, Co.													
Colorado Central													
Cons. Imperial													
Con. Pacific	.46		48	.47	.48	.47	.46	.44	.45	.44	.46	4/5	7,000
Decatur													
Durango, G.													
Eastern Oregon													
Goodshaw, G.													
Harlem M. & M. Co.	.06	.03							.64				2,200
Hortense, S													
Lacrosse, G	.07						.07						600
Mariposa Pref., G													
" Com., G													
Mexican, G. S.	1.75										2.10	2.00	400
Mono													
North Standard, G.													
N. Horn-Silv'r, S. L.													
Ori'nt'l & Miller, S.													
Rappahannock, G.													
Red Elephant, S.	.05										.05		1,200
Ruby, of Arizona													
Silver Cliff, S.													
Sonora Con.	.03										.03		2,700
South Bodie, G.													
South Bulwer, G.													
South Hite													
South Pacific													
State Line, 1 & 4, S.													
" Nos. 2 & 3, S.													
Sutro Tunnel	.16	.11	.18	.16	.19	.18	.17	.15	.16	.15	.16	.15	47,150
Taylor Plumas													
Unadilla, S					2.50		2.00		2.10	2.00	2.05		900
Union Cons., G. S.													

Full tables giving the total amount of dividends, capital, etc., will be printed the first week of each month. Dividend shares sold, 51,220. Non-dividend shares sold 65,750.

natural gas tubing is slow. There are no changes from usual quotations.

Steel Rails —There is nothing doing of consequence, and no new orders that I hear of. Prices may be quoted at $31, but they are sold for $30 in the East. They had better assume higher prices. There is actual loss at these figures, and trade does not improve one wh

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 18.

Anthracite.

The market remains practically unchanged. The majority in the trade report it dull, though some urge that they could easily place more of certain sizes, notably stove. Some of the special coals, too, are reported to be scarce. There is nothing, however, thus far to change the conviction that a restriction in August is necessary, as the figures below will teach. It is, however, insisted by some that it would be better to let the trade have a full month, and then, in September, pull up, if the condition of affairs calls for it. Probably a decision will be reached only at the last moment, so there will be time enough to wait "for something to turn up."

J. H. Jones, official accountant, has issued the following statement of the anthracite coal tonnage for the month of June, 1884, as compared with the same period last year. This statement includes the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines :

	June, 1884.	June, 1883.	Difference.
Phila. & Reading RR	708 689	1,026,526 D.	317,837
Lehigh Valley RR.	†386,044	529,927 D.	143,883
Del., Lack. & West. RR.	342,459	415,032 D.	72,573
Del. & Hud. Canal Co.	‡206,611	287,348 D.	80,736
Pennsylvania RR	276,919	253,672 I.	23,247
Pennsylvania Coal Co.	83,998	124,516 D.	40,518
N. York, L. E. & W. RR.	24,460	33,561 D.	9,101
Total	2,029,179	2,670,582 D.	641,402

† This amount includes the production of the mines of the State Line & Sullivan Railroad Company, amounting to 8673 tons.

‡ In addition, there were 33,595 tons transported from mines by the Delaware & Hudson Canal Company, during June, which is included in tonnage of other interests.

	For Year 1884.	For Year 1883.	Difference.
Phila. & Reading RR.	4,707,532	*5,390,654	D. 683,122
Lehigh Valley RR.	2,590,643	2,848,728	D. 258,085
Del., Lack. & West. RR	2,239,048	2,217,068	I. 22,020
Del. & Hud. Canal Co.	1,422,550	1,531,161	D. 108,610
Pennsylvania RR.	1,444,430	1,208,969	I. 235,461
Pennsylvania Coal Co.	590,139	653,183	D. 63,045
N. York, L. E. & W. RR	164,871	161,004	I. 3,868
Total	13,159,25	14,010,767	D. 851,514

* This amount includes 1,745,398 19 tons carried by the Central Railroad of New Jersey during the first five months of 1883.

The stock of coal on hand at tide-water shipping points, June 30th, 1884, was 704,838 tons ; on May 31st, 1884, 858,837 tons ; decrease, 153,999 tons.

Deducting the tonnage of the Pennsylvania Railroad, we reach a total of 1,752,260 tons for the June output of the companies in the combination. Since there were two weeks' stoppage, we get an output of 876,000 tons a week. It seems fair, therefore, to assume the output of anthracite during continuous work at not less than 825,000 tons a week, thus making an allowance of 475,000 tons a month for the fact that the companies during steady work have no chance to make the preparations for a rush which they do make during alternate week stoppage. Assuming that July will make a record of 2,000,000 tons, and that in December there must be a restriction carrying the output to the same figure, then the tonnage of the four months, from August to November, would be 14,000,000, and the whole year would show a total of 31,000,000 tons. Last year, it was 31,800,000, so that there would be only 800,000 tons to represent a falling off in the consumption due to the inroads of bituminous coal, and to a general dullness in all Eastern manufacturing industries.

According to the above figures, the percentages of the different companies compare as follows for the first six months of the years 1884 and 1883 :

	1884.	1883.
Philadelphia & Reading Railroad	35·77	38·48
Lehigh Valley Railroad	19·69	20·33
Delaware, Lackawanna & Western Railroad	17·02	15·82
Delaware & Hudson Canal Company	10·81	10·92
Pennsylvania Railroad	10·98	8·64
Pennsylvania Coal Company	4·48	4·68
New York, Lake Erie & Western Railroad	1·25	1·15
	100·00	100·02

Bituminous.

The trade remains dull. Occasionally good figures are obtained from transient steamers ; but on the other hand, outside coals continue to sell as low as $2.90.

Philadelphia.

July 18.

[From our Special Correspondent.]

The coal trade is devoid of its usual interest this week, and representatives of the anthracite interests have less than usual to say. The facts of the market can be given in a few words. Stocks at Port Richmond have declined to 17,969 tons to-day, and the Reading people say they will be smaller before the close of the week. The mines are idle this week. Street and office talk as to the probability of a further restriction does not harmonize. On the street, it is predicted that there will be a restriction of at least a week in August, but in the offices this probability is denied. The New York companies want a restriction, but the Philadelphia companies are in favor of a full output from this time out. The trouble with the coal trade is, that the manufacturing requirements are very light, and, what is worse, the probabilities are, that they will continue under the average, and so make the policy of the combination an uncertain one. But the representatives of the trade express no apprehensions, and will restrict if it becomes necessary. There is still some cutting of prices on inferior coals, but best qualities are firm, and it is difficult in some cases to fill orders promptly. The local demand is active, for both manufacturing and domestic purposes, and the retail dealers are satisfied with the way that the fall trade is opening. The Pennsylvania Schuylkill Valley road was opened for freight traffic on Monday, as far as Norristown. The coal companies are not concerned at the organization of the miners, as this organization has no reference to strikes. The miners are in no condition to voluntarily take less work, as they are suffering severely from too little. There is a strong feeling against cheap European labor, and it is probable that the miners will make some expression against it at their meeting to-day in Pottsville. The Reading Company has closed some important contracts, and is in good shape, as are some of the other companies, for full production from this time out. It is probable that there will be full-time ; but all doubt on the subject would be expelled by a little spurt of industrial activity in Eastern Pennsylvania, or an improvement in demand from the West. The Southern coal trade is showing increased activity. The line trade is still backward ; but it is expected that next month's business will be up to that

of last August, at least. There is only a moderate supply of vessels at Port Richmond. There is no change in freight rates. Some of the bituminous companies report increased inquiry for soft coal, to take the place of anthracite, and it is probable that some good orders will be secured during the next few weeks. The price of gas has been reduced from $1.90 to $1.70 per thousand feet, and the residents of the Northern Liberties, where this reduction has not gone into effect, are making vigorous efforts to have rates reduced there. The weekly production of the Clearfield region, as last reported, is 57,059 tons, against 62,980 for the same week last year; total for the year, 1,620,821, against 1,489,052 tons for the same time last year. The Cumberland production for last week was 37,197 tons, against 38,617 for the same week last year, a decrease of 1420; but the total for the year foots up 922,184, as against 797,879 tons for the same time last year, making an increase of 124,205 tons.

Pittsburg. July 17.

[From our Special Correspondent.]

A summary of the very few fresh turns of the coal trade in this section shows a slight improvement in the railroad coal trade, a strike existing along the river, and the coke trade dull.

The railroad mines are not doing much, although they are busier than was the case last week. The pits are working on the average three days a week, while a few are putting in very near full-time. A scarcity of cars exists again, which adds to the dull month of the year in helping the general stagnation. A better feeling among operators is apparent, however, because quite a number of mills that have been idle making repairs and for other purposes have started up this week, and others will follow. When the iron mills are running, there is always a fair coal trade, and as the iron business improves, as it no doubt gradually will through the fall and winter, the coal trade will pick up correspondingly. The trade is yet unsatisfactory, and orders are very slow in coming in. There is also considerable haggling over prices, as customers know the stuff is sold below the quoted 5¾ cent rate. There is no profit below this price, except that of turning over the honest dollar, and this must suffice just now. How successful the operators are in finding new markets for nut and slack, and the small quantity of lump which natural gas is throwing on their hands to be disposed of, are matters that will take some time to find out. Some coal from here is going into the markets filled by Ohio coal since the Hocking Valley troubles began. Both operators and miners here are watching the attempt of the Ohio operators to work foreign miners instead of the union men on strike. An uneasy feeling exists that trouble and perhaps bloodshed will ensue before matters are settled. The miners hereabouts say their Ohio brethren will never submit to have others work in their places, and look upon the present attempt more in the nature of a move against the union than for a reduction of wages. Operators of this section are not saying any thing, preferring to watch developments. But to return to natural gas, a tour of the South Side shows who are using or propose to use it. Jones & Laughlins consume 20,000 bushels of coal daily when operating in full. Their gas derrick is just ready to begin drilling. Atterbury & Co. and Able, Smith & Co., glass manufacturers, and both large consumers of coal, propose to sink wells. Chess, Cook & Co., tack-makers, expect to get gas within thirty days. J. Painter & Sons, are steadily drilling, and when they get a good pressure, Singer, Nimick & Co., steel manufacturers, will promptly put down a well. A small gas flow was struck Wednesday, near Fulton. A small flow has been coming out of the Black Diamond Steel-Works' well since Tuesday. It is down only about 550 feet. A large flow of gas was struck near Hickory, Washington County, on Wednesday, at a depth of 1100 feet. This well is within two miles of the celebrated McGuigan well. Derricks are going up through this section almost as rapidly as they do in a new oil-field. By the way, there was a small oil strike while digging for gas but a few miles beyond the city limits, a few days ago. With what other blessing is nature to furnish Pittsburg?

Concerning the strike of the river coal miners, I can say but little else than I said last week, excepting that indications of the end are at hand. The men are still all idle in the two lower pools; but in the fourth, they are almost all at work at 2¼ and 2½ cents a bushel. The miners' officials all this week have been using strenuous exertions to get them to strike, but without avail. Their working knocks the edge of the sting of the strike elsewhere, as they manage to load about all the coal the operators are caring to lay up in stock. In the third pool, several pits are working; and if the fourth pool men can not be persuaded to quit work, resumption on a large scale must follow in the third. This will be the crisis; for if the third pool should go to work, the strike is burst. They begun it and must end it. There is no local coal trade. The water is too low to boat coal to the flats, and what is there is selling very slowly at retail. The retail price is from 8 to 10 cents, the wholesale from 4½ to 6½ cents, according to the quality. Down the river, prices are unchanged, 6½ cents ruling for fourth pool coal at Cincinnati and Louisville, and 7 cents to 7½ cents for lower pool coal. Stocks are still large and diminishing slowly. If the miners should continue their strike into September, it will improve trade.

About the time the readers of the JOURNAL receive this issue, the coke syndicate will meet and lay out plans for another month. The trade has been such lately that I am told there is little likelihood of either a change in prices or production. Two days' idleness were enjoye last week, Saturday as well as Thursday, to clear off the accumulations of the week of July 1st. The usual reduction of 25 per cent on Thursday was in order this week. Shipments are about 615 cars a day.

Buffalo. July 17.

[From our Special Correspondent.]

As something unusual, let me record that one of your correspondents (excuse me from mentioning which one) was complimented for the "meaty" letters that he sent to your journal. The world moves!

It was rumored that the Philadelphia & Reading Company was not in sympathy with others of the syndicate with regard to curtailing days of mining. I have been assured that the company is in harmony with its *confrères*, and will abide by the decision of the majority. So much for rumor!

The anthracite coal trade is reported to be in good condition by those who are posted; therefore we outsiders must accept the report. It means that prices will be maintained and probably advanced at the first opportunity. Our city trade appears to be brisk from the piles of coal that "adorn" the sidewalks and gutters.

Bituminous coal and coke are unchanged.

On Tuesday last, a number of gentlemen interested in the coal business met in private conference here at the Genesee. Many of the prominent coal dealers of New York State and Pennsylvania were represented. The subject of the meeting was not disclosed other than that the present prices would be maintained. Of those present of the producers, the Delaware, Lackawanna & Western Coal Company was represented by E. R. Holden, of New York, and E. F. Holden, of Syracuse; the Delaware & Hudson Canal Company by J. J. Albright and T. F. Torrey, of Scranton, Pa.; the Pennsylvania Coal Company by W. E. Street, New York; the Lehigh Valley Company by W. H. Sayre, of Bethlehem, Pa.; Cox Brothers & Co., of New York, by E. H. Ely, agent; the New York Central Railroad by W. L. Kingman, of Rochester; the Reading Coal Company by T. Guilford Smith, of Buffalo; the Franklin Coal Company by H. E. Yates, of Rochester; the Butler Collier Company by F. C. Dinning, of Elmira; the New York, Lake Erie & Western Railroad by E. N. Frisbie, general coal agent; W. L. Scott & Co. by J. S. Richards and Mr. Lee, of Erie, Pa. There were also in attendance, Robert Law and A. B. Meeker, Chicago; S. C. Schenck, of the Delaware, Lackawanna & Western, Toledo; Elias Rogers & Co., Toronto; J. A. Frisbie, of the Pennsylvania Coal Company, Elmira; Thomas Hodgson, of the Pennsylvania Coal Company; J. A. McWilliams, of the Delaware & Hudson Canal Company; E. L. Hedstrom, W. H. Davis, Messrs. Lee & Smith, of the firm of Lee, Smith & Moore, and Andrew Langdon, all of Buffalo. Mr. J. J. Albright was the chairman, and Mr. W. E. Street the secretary. The regular monthly meeting will be held at the Glen Mountain House, near Wilkes-Barre, Pa., July 29th.

The New York *Tribune* denies the alleged official authority that the New York, Lake Erie & Western, the Buffalo, New York & Philadelphia, and the Rochester & Pittsburg railroads have reached an understanding on the bituminous coal business. Inquiry among our local coal dealers enables us to say that such an agreement was arrived at, but owing to Mr. Frisbee's changing his mind and refusing to carry out his part of the agreement, the matter remains temporarily unsettled. It is believed, however, by those who ought to know, that the agreement will very soon be practically carried out as before agreed upon, namely, that the rates of freight should be advanced from $1.05 to $1.40 per ton.

Bituminous coal is selling here, as to quality, from $1.60 to $1.90 per ton run of mine.

With grain and ore freights down to the lowest notch and coal freights beginning to weaken, there is a blue outlook for vessel-owners. One of them discourses as follows: "A great depression has come upon the vessel interest, and vessels are not making any money. There is no nonsense about that; every one knows it. Yet we are asked to pay the same rates as ruled when we got good freight rates. There must be a reduction of charges all around or vessels must lie up. Seamen's wages are too high, considering the low freight rates, and the same may also be said of the prices at the ship chandleries, at the ship-yards, and at the dry docks. The harbor towing rates and the towing rates through St. Clair and Detroit rivers ought to be reduced. Grain trimming and shoveling rates ought to come down. The charges of the lumber unloaders, especially, are too high. Grain freights are low and so are lumber. Freights and cargoes are none too numerous, even at the starvation figures that are paid."

Since my last letter, coal has remained very scarce and freight room plenty. Coal has not been in such short supply for years, and there is but little on way from the mines. Two of the Lehigh Valley Company's vessels were ready to load on Monday last, but there was only coal enough for one of them. No change has been made in freight rates, although a cut is expected at any time, as probably some "weak brother" may fall away from rates. The following were the prices paid for the past week: To Chicago, Milwaukee, and Lexington, Lake Huron, 80c.; to Portage, 75c.; to Racine, 90c.; to Saginaw, 35c.; to Duluth, on owners' account; to Port Aitken, $1.05; to Sandusky and Toledo, 30c.; to Port Colborne, —; to Kenosha, 90c.; to Amherstburg, —; and to Detroit, 25c. Closing to-day heavy, and 5c. lower to Chicago and Milwaukee, vessels having been chartered at 75c. to those ports.

Shipments by lake from July 10th to 16th, both days inclusive, 40,630 tons, namely, 17,580 tons to Chicago, 12,730 to Milwaukee, 1300 to Racine, 1320 to Port Arthur, 250 to Saginaw, 220 to Port Colborne, 700 to Kenosha, 4180 to Duluth, 250 to Lexington, 290 to Sandusky, 380 to Amherstburg, 400 to Detroit, 830 to Toledo, and 200 to Au Sable.

Receipts of coal by canal for the week ended 12th instant, 3937 tons; shipments for the same period, 1163 tons.

Receipts of coal by lake for the week, 300 tons; by Lake Shore & Michigan Southern Railroad, 264 tons; 168 tons for Buffalo, and 96 tons for other points.

The charters of coal for the week were: 1 load to Lockport, at 30c. net ton, free on and off; 3 loads coal-dust to Syracuse, 65c. gross ton, captain to pay unloading. Nominal rate to Albany, 95c.; and to New York, $1.30 per net ton, captain to pay unloading.

Yesterday was the last day for receiving bids for coal for the Grand Trunk Railroad of Canada. The kinds and quantities were as follows: 400 tons egg and 500 tons stove, delivered on cars, duty paid, at Brockville or Belleville; 1500 tons egg, 1000 tons stove, and 1000 tons chestnut, delivered at Suspension Bridge or International Bridge; also, from 800 to 900 tons McIntyre Smith's coal, delivered at points where ordered.

No gleanings are to be found of railroad items of interest at this point.

From Duluth papers, I find the receipts of coal at that port for the week ended the 12th instant, 13,824 tons. This makes the aggregate for the season 162,920 tons.

Boston. July 17.

[From our Special Correspondent.]

The anthracite branch of the market continues to be fairly busy in the delivery of June orders, but the amount of July business continues very small. We hear of no sales at the full advance of 25 cents, and the market will consider itself fortunate if that advance shall be established in August. At the same

time, stocks of coal at tide-water are indeed light. The Philadelphia & Reading Company complains particularly of the small amount that is available for Eastern shipment, and claims to be holding for full July circular of $4.15 for Stove. We hear of no offers above $4.15 f. o. b. at New York for Stove; and if that figure has been met, jobbers have thus far been unwilling to acknowledge it. Of course, outside operators take times like these to press their coal at from 5 to 10 cents a ton below company prices; but in no direction is much done. Pocket trade is at a stand-still. A short time will witness renewed activity, it is believed.

We quote f. o. b. prices in buyers' favor at following nominal figures: At New York, Stove, $4 25; Broken and Egg, $3 65; individual coals, $4.15@$4.20 for Stove, $3.50 for Broken and Egg. At Philadelphia, $3.90@$4 for Stove, $3.65 for Chestnut, $3.35@$3.50 for Broken and Egg, $2 50 for Pea. Special coals, $4.85 for Broken, $5.35 for Stove.

There seems to have been a little more business doing in bituminous coal of late, noting half a dozen sales in one and two thousand ton lots for the week. A good many consumers are understood to have bought rather short allowance at the beginning of the season. Prices continue "way down" and ranging from $3.50@$3.85 delivered. Against such figures, provincial culm can not make much headway, although it is selling at the very low figure of $2.50 delivered. Many consumers seem to think that $1 a ton is not sufficient inducement. If signs do not fail, there will be even less importation of culm next season. No gas-coal business is done.

It may be mentioned, as a matter of interest, that the South Boston Iron-Works use gas-coal in casting cannon. It took 50 tons of Penn gas-coal to feed the three furnaces, which produced 120 tons of iron for the last casting. The furnaces were run fifteen hours.

There has been a further weakness in freights, and skippers are more disgusted than ever. We note Philadelphia charters at $1.10; Baltimore, $1.30; and New York, 90 cents. We quote:

New York, 90c.@$1 a ton; Philadelphia, $1.10@$1.20; Baltimore, $1.30@$1.35; Newport News, $1.25; Richmond, $1.30@$1.35; Bay of Fundy, $1.50@$1.60; Cape Breton, $1.80@$1.90.

There is a little better retail trade to note at nominally unchanged figures. Dealers talk more hopefully of an advance. We quote:

White ash, furnace, and egg	$5.25@5.50
" " stove and nut	5.50@5.75
Red ash, egg	5.75@6.00
" " stove	6.00@
Lorberry, egg and stove	6.50@
Franklin, egg and stove	7.25@7.50
Lehigh, furnace, egg and stove	5.50@5.75
" nut	5.50@5.72

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite coal for the week ended July 12th, and year from January 1st:

TONS OF 2240 LBS.	1884. Week.	1884. Year.	1883. Week.	1883. Year.
Wyoming Region.				
D. & H. Canal Co.	112,092	1,756.740	51,063	1,841,418
D. L. & W. RR. Co.	130,126	2,387,843	69.472	2,333,724
Penna. Coal Co.	40,434	597,255	22,233	659,925
L. V. RR. Co.	40,258	669,441	.....	525,965
P. & N. Y. RR. Co.	8,525	105,518	4,036	104,054
C. RR. of N. J	*	*	.....	1,202,078
Penn. Canal Co.	12,293	168,733	6,634	172,371
North & West Br. RR.	14,573	421,769	15,358	245,612
	358.299	6.108,099	168.796	7,085,147
Lehigh Region.				
L. V. RR. Co.	158.265	2,184,189	.....	2,333.044
C. RR. of N. J	*	*	.....	1,126.889
S. H. & W. B. RR.	6,877	113.757	2,561	29,656
	165.142	2,297,946	2,561	3,489,589
Schuylkill Region.				
P. & R. RR. Co.	379,224	5,208.494	109,141	3,401,305
Shamokin & Lykens Val.	*	*	29,236	704,215
	379,224	5,208,494	138,377	4,105,520
Sullivan Region.				
St Line & Sul. RR. Co.	766	43,338	896	31,996
Total	903,431	13,657,877	310,630	14,712,252
Increase	.....	.....	.....	.....
Decrease	.....	.....	1,054,375	.....

* Included in tonnage of the Philadelphia & Reading Railroad.

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Total same time in 1879	13,120,529 tons.
" " " " 1880	11,107,215 "
" " " " 1881	13,663,325 "
" " " " 1882	13,901,634 "

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 124,305 tons, as compared with the corresponding period in 1883.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to July 17th.

PORTS	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnston, South Amboy, Hoboken, and Weehawken.
Alexandria	.65	...	...
Annapolis	...	...	...
Albany	...	...	...
Baltimore	.58§	...	...
Bangor	1.20	1.30	...
Bath, Me	1.10@1.15	1.30	1.00
Beverly	1.10@1.15	...	1.00
Boston, Mass	1.10@1.15	1.20@1.25	.90@.95
Bristol	...	...	...
Bridgeport, Conn	...	1.10@1.15	.50
Brooklyn	...	1.05@1.07½	...
Cambridge, Mass.	1.15‡	...	.95‡
Cambridgeport	1.15‡	...	.95‡
Charleston, S. C.	.70	.70@.75	...
Charlestown	...	...	...
Chelsea	...	...	.95
City Point	...	...	...
Com. Pt., Mass.	1.25	...	.95
E. Boston	1.10	...	.95
East Cambridge	1.15‡	...	.95‡
E. Gr'nwich, R. I.	...	...	...
Fall River	1.05	...	.95
Galveston	2.80	...	...
Gardiner, Me	...	...	...
Georgetown, D.C.	.65	...	...
Gloucester	1.15	...	...
Hartford	...	...	...
Hackensack	...	...	...
Hudson	...	...	...
Lynn	1.25@1.30	...	...
Marblehead	1.15	...	...
Medford	...	...	...
Millville, N. J.	...	...	...
Milton	...	...	...
Newark, N. J.	...	1.20	...
New Bedford	1.05	1.15@1.20	.80
Newburyport	1.25	1 35@1.40	1.15
New Haven	...	1.10@1.15	.50
New London	...	...	...
New-Berne	...	...	...
Newport	1.10	...	.75
New York	.55@.60	1.00@1.05	...
Norfolk, Va	...	...	.75
Norwich	...	...	...
Norwalk, Conn	...	...	...
Pawtucket	...	...	...
Philadelphia	...	...	...
Portland, Me.	.85*	1.25@1.30	.90
Portsmouth, Va.	.60	...	...
Portsmouth, N.H.	...	1.35	1.10
Providence	1.05	1.10@1.15	...
Quincy Point	...	...	1.10
Richmond, Va.	.80	...	...
Rockland, Me.	...	...	...
Rockport	...	...	...
Roxbury, Mass.	1.10‡	...	...
Saco	...	...	...
Sag Harbor	...	...	...
Salem, Mass.	1.15@1.25	...	1.00
Saugus	...	...	...
Savannah	...	1.00@1.05	...
Somerset	1.05	...	.80
Staten Island	...	...	...
Trenton	...	...	...
Troy	...	...	...
Wareham	...	...	...
Washington	.65@.70	...	...
Weymouth	...	...	...
Williamsbg, N.Y.	...	...	...
Wilmington, Del.	...	...	...
Wilmington, N.C.	...	1.00	...
St. Thomas, W. I.	...	...	...

* And discharging. † And discharging and towing. ‡ 3c. per bridge extra. § Alongside. ¶ And towing up and down. ¶ And towing. ** Below bridge.

RICHARDS & CO.,

ASSAYERS' SUPPLIES,

398 Bowery, New York.

Comparative Statement of the Production of Bituminous Coal for the week ended July 12th and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

	1884. Week.	1884. Year.	1883. Week.	1883. Year
Cumberland Region, Md.				
Tons of 2240 lbs	60,543	1,401,725	59,808	1,210,353
Barclay Region, Pa.				
Barclay RR., tons of 2240 lbs	3,315	170,294	4,723	168,209
Broad Top Region, Pa.				
Huntington & Broad Top RR., of 2240 lbs	3,649	100,538	3,563	103,339
East Broad Top	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe	2,820	97,166	4,025	128,010
Karthaus (Keating)	920	15,271	.....	.....
Tyrone & Clearfield	56,472	1,616,531	62,709	1,477,264
Alleghany Region, Pa				
Gallitzin & Mountain	7,184	201,206	7,312	236,089
Pittsburg Region, Pa.				
West Penn RR	4,605	151,419	8,150	234,972
Southwest Penn. RR.	937	77,718	1,688	57.822
Pennsylvania RR	5,178	149,957	10,865	271,837
Westmoreland Region, Pa.				
Pennsylvania RR	27,886	653,448	22,208	723,355
Monongahela Region, Pa.				
Pennsylvania RR	2,717	82,155	.....	.....
Total	176,226	4,717,428	185,051	4,611,250
Increase	.....	106,178	.....	.....

MEETINGS.

OFFICE OF THE IRON SILVER MINING COMPANY, Mills Building, 23 Broad Street,
NEW YORK, July 1, 1884.

A special meeting of the stockholders will be held at the office of the company (as above), Monday, July 28th, at twelve o'clock M., for the purpose of conveying a portion of their property to a new company.

Books will close July 25th at three o'clock, and open July 30th.

HOMER A. HOIT, Secretary.

THE HECLA POWDER CO.,

239 Broadway, New York.

ELECTRIC AMALCAM.

$2 per lb., $1 per half lb. Trial Bottle, Post-paid. Send for Trial Lot and Circulars.

THIS IS AN ABSOLUTE STORAGE OF ELECTRICITY, SAVING GOLD, KEEPING PLATES BRIGHT, SOFT, AND CLEAN, PREVENTS FLOWERING, AND SICKING OF QUICKSILVER.

UNITED STATES ASSAY OFFICE, 30 WALL ST.

Electric Amalgam Co.: NEW YORK, July 9, 1884.

GENTLEMEN: We have analyzed a sample of your Sodium [Electric] Amalgam, which gave 2½ per cent of Sodium.

We have used 10 parts of common quicksilver on a small quantity of free gold ore, and extracted 5 ounces per ton. By use of 8 parts of common quicksilver and 2 parts of your Amalgam, extracted at the ratio of 36 ounces per ton. Yours respectfully,

(Signed) TORREY & EATON.

DR. J. H. RAE, Agent, 7 Exchange Place, Boston, Mass.